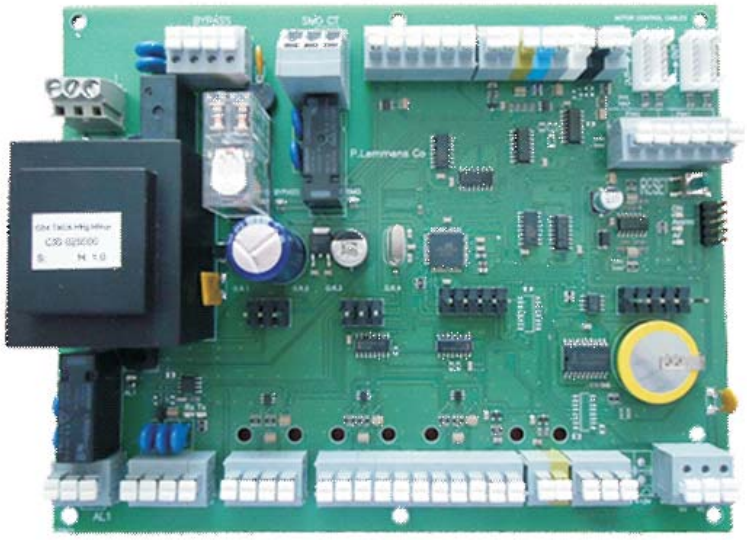
Control unit

TAC4 DG + RC

Installation and maintenance



Operating Instructions

Please keep careful!

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0 Preamble

PLEASE READ THIS MANUAL CAREFULLY BEFORE INASTALLATION AND COMMISSONING!
THIS MANUAL HAS BEEN MADE WITH GREATEST CARE.
HOWEVER, NO RIGHTS CAN BE DERIVED THEREFROM. WE RESERVE THE RIGHT AT ANY TIME TO PARTIALLY OR ENTIRELY CHANGE THE CONTENT OF THIS MANUAL WITHOUT PRIOR NOTICE.

This manual contains all the best for an assembly plant and a heat recovery unit (HRU) necessary information. The manual also serves as a handbook for installation, maintenance and customer service work. We recommend that any intervention in the appliance installation company should be consulted.

Subject of this operating manual is the control unit TAC4 with the operating unit RC TAC4. Possible accessories are only described insofar as it is necessary for the appropriate operation. Please see the particular manuals for further information on accessories.

If you have any questions that have not been answered or have not been sufficiently answered in this documentation, please contact the company Paul Wärmerückgewinnung GmbH. We will be glad to help you.

1 Introduction

1.1 Safety

Please always observe the safety instructions in this operating manual. The non-observance of the safety instructions, warning notices, notes and instructions can lead to injuries or damages to the maxi.

- Unless otherwise stated in this operating manual, only an authorised installer is entitled to install, connect, put into operation and maintain the maxi;
- The installation of the maxi is to be performed according to the general local building, safety and installation instructions of the corresponding local authorities, of the water works and electric works and other official regulations and directives;
- Always follow the safety instructions, warning notices, notes and instructions described in this operating manual;
- Please keep this manual during the complete life time of the maxi in proximity to the device;
- The instructions for the regular replacement of the filters or the cleaning of the supply and exhaust air valves are to be strictly followed;
- The specifications stated in this document may not be changed;
- Any modification of the maxi is prohibited;
- In order to guarantee that the device will be regularly controlled, it is recommended to conclude a maintenance contract. Your supplier can give you the addresses of authorised installers in your area.

1.1.1 Used symbols

The following symbols are used in this manual:

Caution, special note!

Risk of: ***- injury of the user or the installer***
- damages to the device
- impairment of the operation of the device if the instructions are not carried out properly

2 FUNCTIONALITIES OF THE REGULATION

The TAC4 DG controller is mounted in the units of maxi-series.

This handbook describes the functionalities of the TAC4 DG when using an RC TAC4 display.

The TAC4 DG with RC TAC4 controller provides the following features:

- Monitoring of the fans (exhaust and supply) in chosen working mode: constant airflow (CA), constant pressure (CPs) or constant airflow linked to 0-10V signal (LS) (e.g. CO2 sensor).
- Management of 4 timeslots.
- Alarms on defects, set points, overpressure.
- Fire alarm airflow management.
- BOOST function, allowing to force a pre-set airflow (supply/exhaust), overriding the assigned airflow
- Automatic management of the 100% bypass to allow free cooling.
- Automatic management of inlet dampers (CT).
- Heat exchanger antifreeze protection system by modulation of airflow or with an intelligent pre-heat electrical coil (KWin).
- Post heating management of water coil (NV) or electrical coil (KWout) battery to keep a set temperature constant.
- Display of the settings and working fans
- Analogical output signals of airflow and pressure
- Advanced setup

The following options can be combined with TAC4 DG controller:

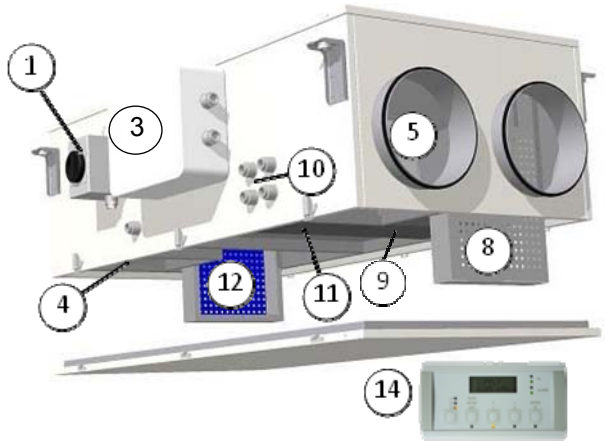
- SAT TAC4 BA/KW Option:
  Regulation of 2 external heat exchangers (electrical/water, hot and/or cold).
- SAT TAC4 MODBUS Option:
  MODBUS RTU communication (please refer to TAC4 DG - MODBUS RTU installation and user's manual for detailed information).
- TCP/IP TAC4 MODULE Option:
  MODBUS TCP/IP communication (please refer to TAC4 DG - MODBUS TCP/IP installation and user's manual for detailed information).
- GPRS TAC4 MODULE Option:
  GPRS Communication (please refer to TAC4 DG - GPRS installation and user's manual for detailed installation).
- The SAT3 Option is a Circuit with 2 relays (2 SAT3 can be plugged)
  - When plugged in position OR1/OR2: status of "Fan On" warning and of "Pressure alarm" warning and/or
  - When plugged in position OR3/OR4 : status of NV option circulator and of «bypass»

See separate installation manual for each of these options.

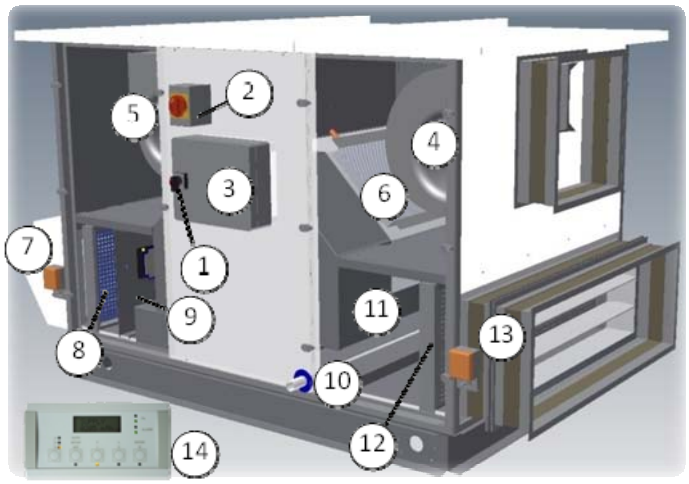
3 GENERAL MAINTENANCE INSTRUCTIONS

3.1 Generell information

3.1.1 Generell schematic of the maxi-series



Maxi flat-series

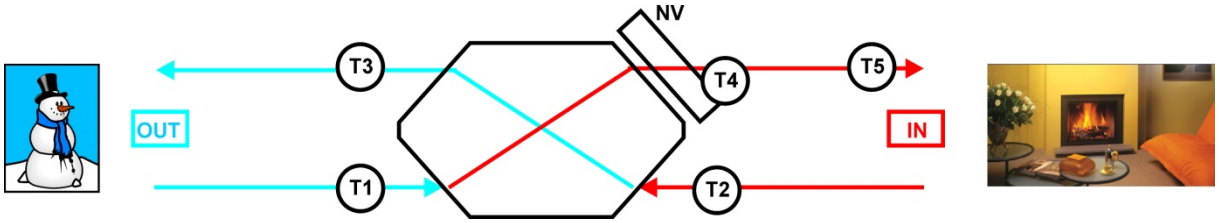


Maxi-series

1 Main switch for power supply fans and control
2 Main switch for power supply to pre (Kwin) and/or post (Kwout) heating coils (options)
3 Centralized wiring box of the CB4 TAC4 DG circuit (factory pre-wired)
4 Supply fan(s)
5 Exhaust fan(s)
6 Post-heating water or electrical coil (NV or KWout option)
7 Motorized damper at fresh air inlet (CT option)
8 F7 class filter at fresh air inlet (G4- class filter extract air maxi flat right model versions)
9 Pre-heating electrical antifreeze coil (KWin option)
10 Drain pan and drain (maxi flat-series: drain pipe out)
11 Air/Air heat exchanger + bypass 100%
12 G4 filter on extract air (G4- or F7- class filter fresh air maxi flat right model versions)
13 Motorized damper at extract air inlet (option)
14 RC TAC4

All electrical connections made the installer are in 1/2/3.

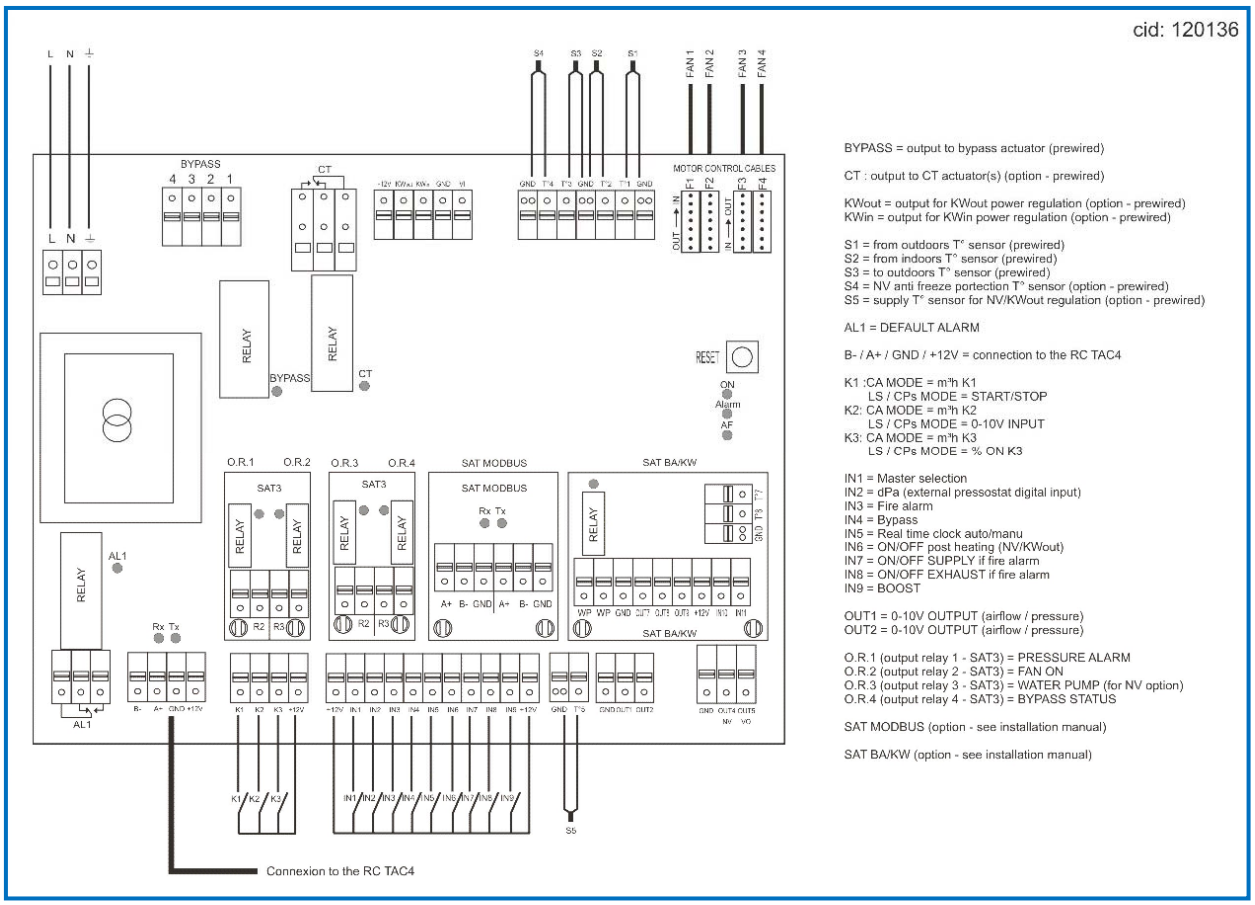
3.1.2 Schematic of the T° sensors positioning in the maxi unit



To allow easier identification of the temperature sensors 4 different wire colors are used:

- T1: black wire
- T2: white wire
- T3: blue wire
- T4 & T5: green wire (not at maxi flat-series)

3.1.3 Control panel 3 label located inside the cover


cid: 120136
BYPASS = output to bypass actuator (prewired)
CT : output to CT actuator(s) (option - prewired)
KWout = output for KWout power regulation (option - prewired)
KWin = output for KWin power regulation (option - prewired)
S1 = from outdoors T° sensor (prewired)
S2 = from indoors T° sensor (prewired)
S3 = to outdoors T° sensor (prewired)
S4 = NV anti freeze portection T° sensor (option - prewired)
S5 = supply T° sensor for NV/KWout regulation (option - prewired)
AL1 = DEFAULT ALARM
B- / A+ / GND / +12V = connection to the RC TAC4
K1 :CA MODE = m³h K1
LS / CPs MODE = START/STOP
K2: CA MODE = m³h K2
LS / CPs MODE = 0-10V INPUT
K3: CA MODE = m³h K3
LS / CPs MODE = % ON K3
IN1 = Master selection
IN2 = dPa (external pressostat digital input)
IN3 = Fire alarm
IN4 = Bypass
IN5 = Real time clock auto/manu
IN6 = ON/OFF post heating (NV/KWout)
IN7 = ON/OFF SUPPLY if fire alarm
IN8 = ON/OFF EXHAUST if fire alarm
IN9 = BOOST
OUT1 = 0-10V OUTPUT (airflow / pressure)
OUT2 = 0-10V OUTPUT (airflow / pressure)
O.R.1 (output relay 1 - SAT3) = PRESSURE ALARM
O.R.2 (output relay 2 - SAT3) = FAN ON
O.R.3 (output relay 3 - SAT3) = WATER PUMP (for NV option)
O.R.4 (output relay 4 - SAT3) = BYPASS STATUS
SAT MODBUS (option - see installation manual)
SAT BA/KW (option - see installation manual)
Connexion to the RC TAC4

4 REGULATION: CONFIGURATION – WIRING – OPERATING

The regulation is delivered fully factory pre-wired. Nevertheless, the TAC4 RC (remote control) and the i/o signals if any must still be wired by the installer.

4.1 Connecting the RC TAC4 to the CB4 TAC4 DG circuit

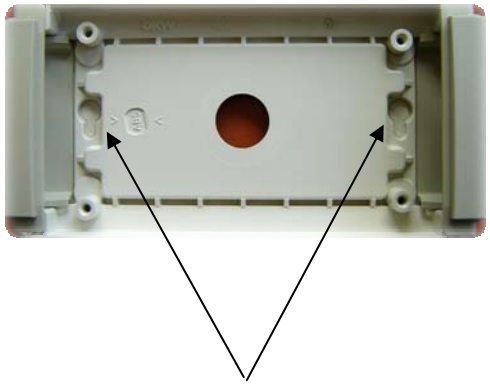
The connection between the various circuits is made by a communication bus.
Follow these steps to connect the RC TAC4 to the CB4 TAC4 DG:

4.1.1 Open the RC TAC4 casing

Using a small screwdriver unlock the 4 pins

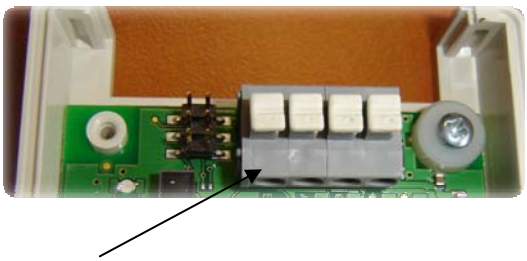
2 pins on each side

Remove the cover



Points for fixation of the casing (spacing = 88mm)

RC dimensions = 122 x 66mm

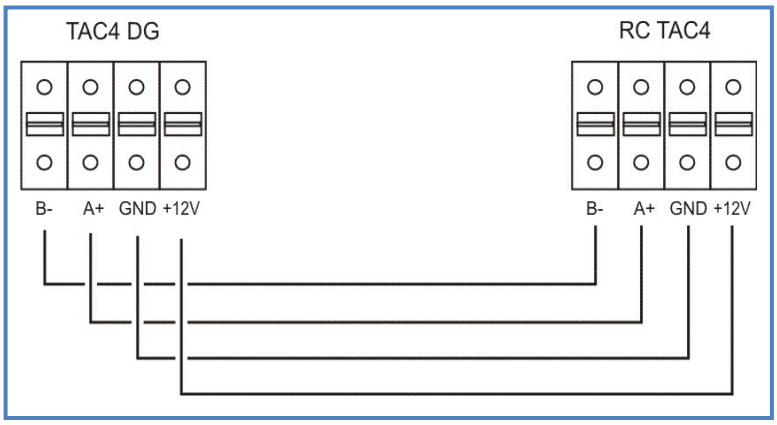


RC TAC4 wiring terminals

The RC box is class IP20 and cannot be installed outdoors as such. If you wish to install it outdoors (for instance on the maxi unit) you need to fasten inside a proper watertight box.

The configuration data is stored in the TAC4 DG circuit. Therefore, unlike the previous generation, the RC does not have to be permanently connected for the regulation to operate properly.

4.1.2 Wiring diagram to connect the RC TAC4 REC to the TAC4 DG circuit



4.1.3 Cable specifications

- Recommended cable: category 5 shielded twisted pair (FTP) cable with a section of 0,26 … 0,50 mm². Use 1 pair to connect GND and +12V and 1 pair to connect B- and A +
- Maximum cable length: 1000 m.
- Keep this communication cable at distance from power cables..
- If the unit is installed in a location with high electro-mechanical interference levels we strongly advise to connect the armored shield of the TAC4 DG – GRC cable on one side of the ground only.
- If the maxi unit is installed outside, select a suitable cable for outdoor application (UV light, …).

4.2 Selecting the Master

« Selecting the master » means the determination of which module of the i/o and the RC will “control” the fans, “controlling” the fans means:
- If CA mode is chosen (see § 4.3.2), to be the master means to control the start/stop of the fans as well as to select the airflow
- If LS or CPs mode (see § 4.3.3 and 4.3.4), to be the master means to control the start/stop of the fans as well as to activate/deactivate a different assignment (assignment multiplier).

2 setups are possible:

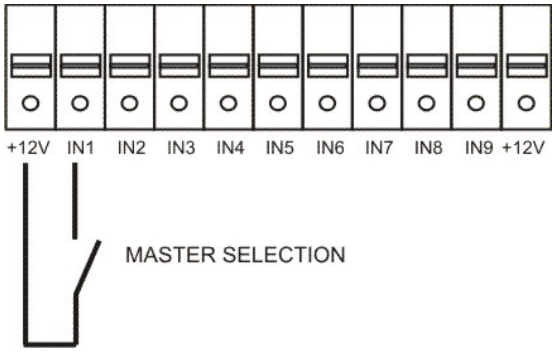
1) Or TAC4 DG circuit is « master »: contact between terminals IN1 and +12Vdc of TAC4 DG circuit is closed.
- The TAC4 DG circuit allows control of the fans through its inputs.
- The RC TAC4 allows to configure and to visualize all the parameters on the display and with the LEDs,

2) Or RC TAC4 is « master »: contact between terminals IN1 and +12Vdc of TAC4 DG circuit is open.
- The TAC4 DG circuit is then in control of the system and serves as a control hub between fans and the RC TAC4.
- The RC TAC4 allows to configure and to visualize all the parameters on the display and with the LEDs,
- The RC TAC4 controls the fans with the OFF / I / II / III keys,

TAC4 DG circuit is master

RC TAC4 is master

Wiring diagram



Contact closed = TAC4 DG circuit master
Contact open = RC TAC4 master
Caution: Use gold-plated contact only.

The use of this contact enables to switch automatically from RC TAC4 master to TAC4 DG master.

Using this you can for instance:

- Work in RC TAC4 master and switch in position TAC4 DG master to stop automatically the fans (attention, in this case the inputs K1/K2/K3 on the TAC4 DG have to be disconnected from the +12V).

- Work in RC TAC4 master and switch in position TAC4 DG master to activate automatically a sleep value (attention K1/K2/K3 on the TAC4 DG have to be properly connected to activate this value).

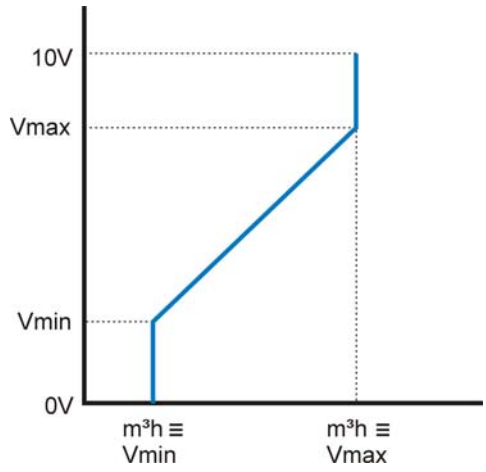
4.3 Fan control

4.3.1 Working modes

The various working modes give the user the choice on how the airflow must be modulated according to your application.
In all the working modes the **supply fan** will operate according to the assigned mode and parameters. The airflow of the **exhaust fan** will then equal to a percentage of the actual airflow of the supply fan (noted %EXT / PUL for ratio between exhaust and supply airflows).
The RC TAC4 allows configuration of one of the following 4 modes:

- **CA MODE:**
  3 constant airflow assignments for the supply fan are determined by the user (m³h K1, m³h K2 and m³h K3).

- **LS MODE:**
  The assigned supply airflow is a function of a 0-10V linear signal. The user defines the link with 4 parameters: Vmin, Vmax, m³h≡Vmin and m³h≡Vmax, applied to the following diagram:



With m³h≡Vmin < or > m³h≡Vmax (positive or negative link).

Using the advanced setup, it is possible to stop the fans once the input signal value has reached a certain upper and/or lower limit.

- **CPs MODE:**
  CPs on supply: the airflow of the supply fan(s) is modulated so as to maintain constant a certain pressure value measured by a pressure sensor properly located in the ducting.
  CPs on exhaust: the airflow of the exhaust fan(s) is modulated so as to maintain constant a certain pressure value measured by a pressure sensor properly located in the ducting.

- **MODE OFF:**
  Is not a real working mode, it is a way to temporarily shortcut the TAC4 DG master setup. It allows, if working in TAC4 DG master, to stop the fans with the RC TAC4. But then to restart the fans it is required to choose one of the other 3 working modes.

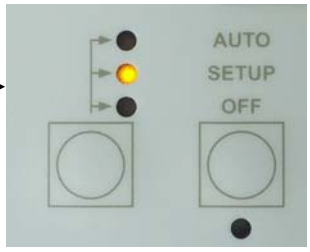
4.3.2 CA mode: setup, operating instructions and wiring diagrams

4.3.2.1 Setup CA mode

The setup is made by means of the LCD screen and the 4 knobs SETUP, ↑, ↓ and ENTER of the RC.

To start the setup:

- Enter in the setup mode using the left knob on the diagram so that the SETUP LED ignites.



- Press then the SETUP knob until the text 'SETUP' appears on the screen.

The idea is to select your choice with the ↑↓ knobs and then to confirm your choice by pressing 'ENTER'. The numbers are introduced digit by digit.

1	**LANGUAGE**	Choose your language (English, French, Dutch, German)
2	**HEATING T°? xx°C**	Only available with post-heating exhanger(s), Select the supply T° to the heating exhanger which is connected to the SAT BA.
3	**COOLING T°? xx°C**	Only available with post-cooling exhanger(s), Select the supply T° to the cooling exhanger which is connected to the SAT BA.
4	**WORKING MODE**	Select CA from CA, LS, CPs
5	**m³h K1?**	Type in supply airflow 1 (will be activated if contact between K1 and +12V of TAC4 DG circuit closed or if position I on RC TAC4 is selected)
6	**m³h K2?**	Type in supply airflow 2 (will be activated if contact between K1 and +12V of TAC4 DG circuit closed or if position II on RC TAC4 is selected)
7	**m³h K3?**	Type in supply airflow 3 (will be activated if contact between K1 and +12V of TAC4 DG circuit closed or if position III on RC TAC4 is selected)
8	**%EXH/SUP**	Type in ratio between exhaust (EXH) and supply (SUP) airflow to create over, under or even pressure.

9	**TIME SEGMENT?N**	Select Y to activate the time segment scheduling function
10	**CONFIG TIME? N**	Select 'Y' to activate time segment function
11	**…**	For more details see § 4.4
12	**PRESSURE ALARM?**	The pressure alarm is optional. If you do not wish it select N and skip to step 14. Otherwise select Y. For more details see § 4.5
13	**∆P SUP**	Type in the pressure increment for the supply airflow.
14	**∆P EXH**	Type in the pressure increment for the exhaust airflow.
15	**INIT Pa REF?**	Do you wish to (re-)configure the reference pressure for the supply and the exhaust airflows? Y or N. (this is optional if it has been done previously)
16	**m³h INIT**	If Y is selected, enter nominal airflow at which you wish to initialize the reference pressure. (same airflow for exhaust and supply air)
17	**Pa REF INIT** **xxxx m³h xxxx Pa**	Initializing the reference pressure… After +/-1 minute, the system will memorize the calculated pressure value of the fan as the reference pressure. While initializing the airflow and pressure on F1 is displayed.
18	**ALARM RESET?**	Possibility to reset the alarms. Y or N?
19	**END SETUP**	End

4.3.2.2 Operating CA mode with RC TAC4 master

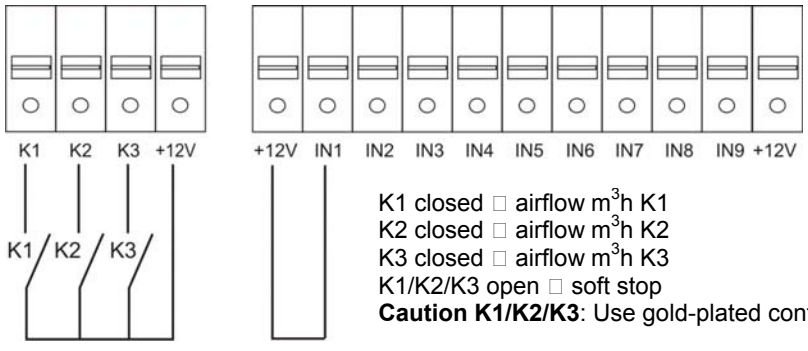
- One of the 3 assignment constant airflows (m³h K1, m³h K2 and m³h K3) is selected using the I / II / III knobs of the RC TAC4. The selection made is highlighted by the corresponding LED on the RC. The exhaust airflow is equal to (%EXT/PUL) of the supply airflow.
- The OFF touch allows stopping the fans.

4.3.2.3 Operation CA mode with TAC4 DG master

One of the 3 assignment constant airflows (m³h K1, m³h K2 and m³h K3) is selected using the K1/K2/K3 terminals on TAC4 DG. The selection made is highlighted by the corresponding LED on the RC TAC4). The exhaust airflow is equal to (%EXT/PUL) of the supply airflow.

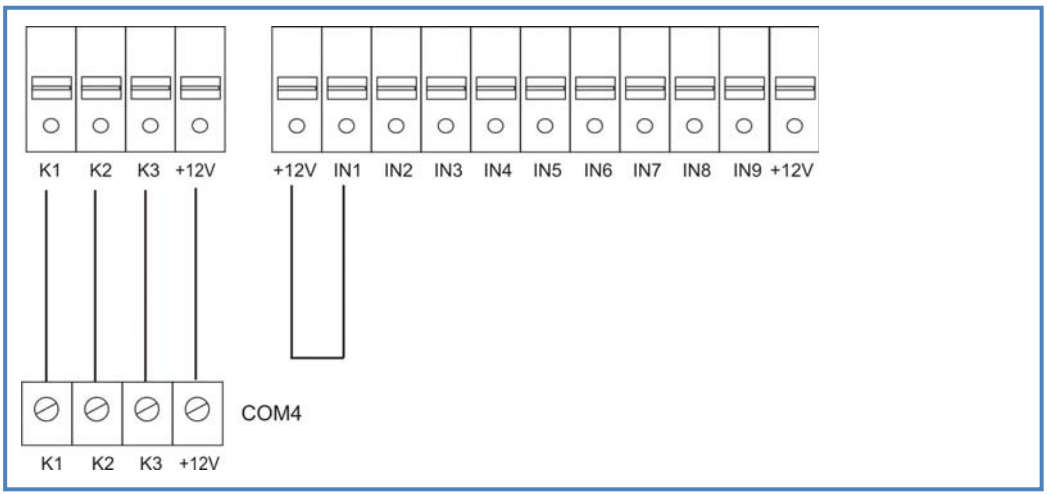
Wiring diagrams

a) Wiring 1 circuit to 3 external contacts

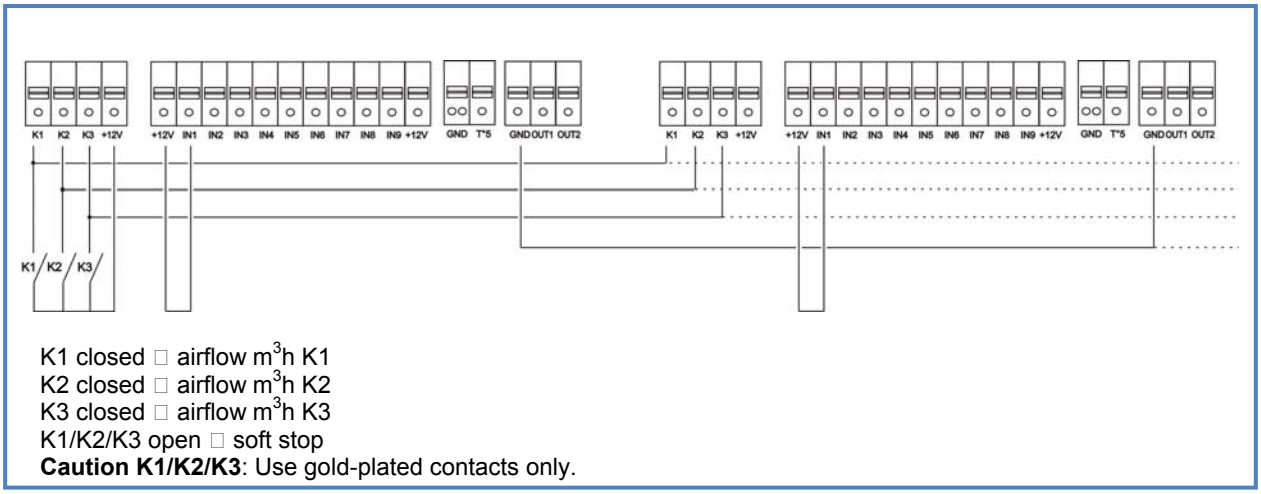


K1 closed □ airflow m^{3}h K1
K2 closed □ airflow m^{3}h K2
K3 closed □ airflow m^{3}h K3
K1/K2/K3 open □ soft stop
Caution K1/K2/K3: Use gold-plated contacts only.

b) Wiring 1 circuit to 1 COM4 (PLC 4 positions switch)

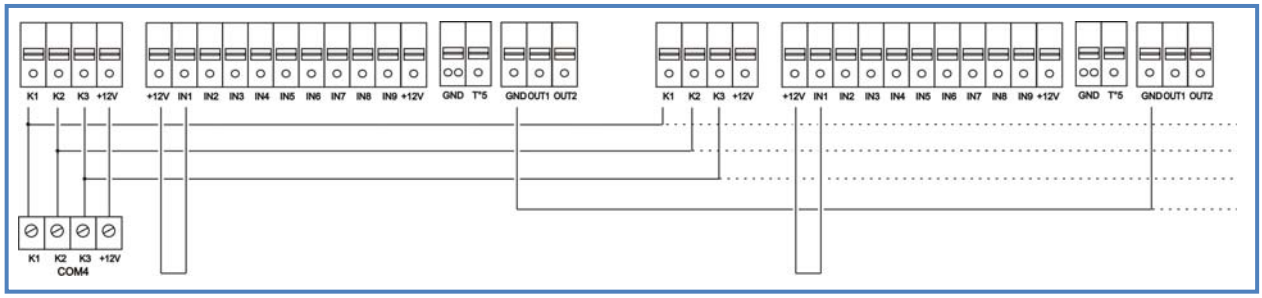


c) Wiring several circuits to 3 external contacts



K1 closed □ airflow m^3h K1
K2 closed □ airflow m^3h K2
K3 closed □ airflow m^3h K3
K1/K2/K3 open □ soft stop
Caution K1/K2/K3: Use gold-plated contacts only.

d) Wiring several circuits to 1 COM4



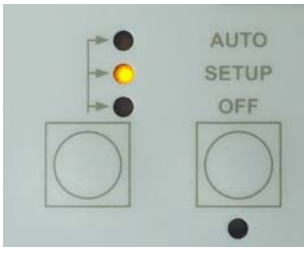
4.3.3 LS mode: setup, operating instructions and wiring diagrams

4.3.3.1 Setup LS mode

The setup is made by means of the LCD screen and the 4 knobs SETUP, ↑, ↓ and ENTER of the RC.

To start the setup:

- Enter in the setup mode using the left knob on the diagram so that the SETUP LED ignites. →



- Press then the SETUP knob until the text ‘SETUP’ appears on the screen.

The idea is to select your choice with the ↑↓ knobs and then to confirm your choice by pressing ‘ENTER’. The numbers are introduced digit by digit.

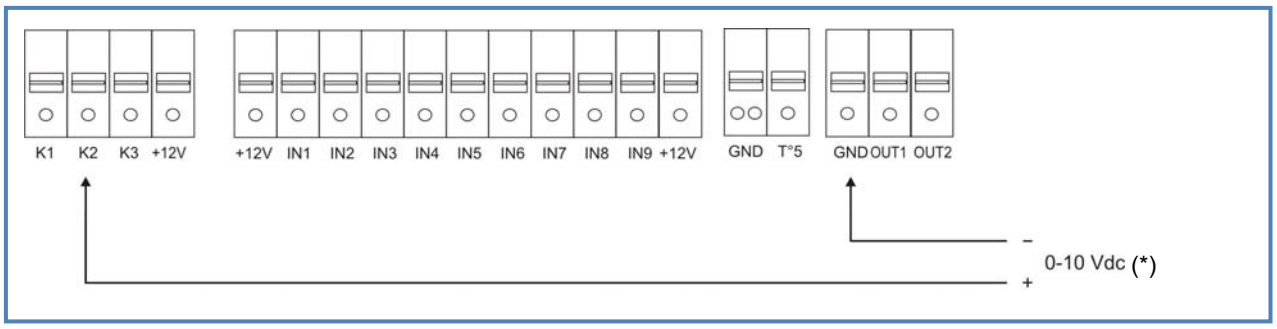
1	**LANGUAGE**	Choose your language (English, French, Dutch, German)
2	**HEATING T°? xx°C**	Only available with post-heating exchanger(s), Select the supply T° to the heating exchanger which is connected to the SAT BA.
3	**COOLING T°? xx°C**	Only available with post-cooling exhanger(s), Select the supply T° to the cooling exhanger which is connected to the SAT BA.
4	**WORKING MODE**	Select LS from CA, LS, CPs
5	**V min?**	Select minimum voltage value
6	**V max?**	Select maximum voltage value
7	**m³/h≡Vmin**	Select constant airflow value for minimum voltage Vmin
8	**m³/h≡Vmax**	Select constant airflow value for maximum voltage Vmax
9	**% on K3?**	Select constant airflow multiplier when contact between terminals +12V and K3 in the TAC4 DG is closed, or if position III is activated on the RC TAC4.
10	**%EXH/SUP**	Type in ratio between exhaust (EXH) and supply (SUP) airflow to create over, under or even pressure.
11	**TIME SEGMENT?N**	Select Y to activate the time segment scheduling function
12	**CONFIG TIME? N**	Select 'Y' to activate time segment function
13	**…**	For more details see § 4.4
14	**PRESSURE ALARM?**	The pressure alarm is optional. If you do not wish it select N and skip to step 16. Otherwise select Y. For more details see § 4.5
15	**ΔP SUP**	Type in the pressure increment for the supply airflow.
16	**ΔP EXH**	Type in the pressure increment for the exhaust airflow.
17	**INIT Pa REF?**	Do you wish to (re-)configure the reference pressure for the supply and the exhaust airflows ? Y or N. (this is optional if it has been done previously)
18	**m³h INIT**	If Y is selected, enter nominal airflow at which you wish to initialize the reference pressure. (same airflow for exhaust and supply air)
19	**Pa REF INIT** **xxxx m³h xxxx Pa**	Initializing the reference pressure… After +/-1 minute, the system will memorize the calculated pressure value of the fan as the reference pressure. While initializing the airflow and pressure on F1 is displayed.
20	**ALARM RESET?**	Possibility to reset of the alarms. Y or N ?
21	**END SETUP**	End

4.3.3.2 Operating LS mode with RC TAC4 master

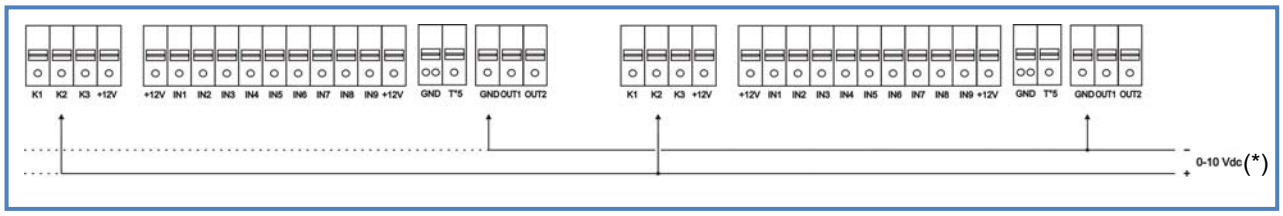
The assignment value for the supply constant airflow is a function of a 0-10V signal connected to terminals K2 of the TAC4 DG circuit. The link between voltage and airflow is linear. The exhaust constant airflow is equal to %EXT/PUL of the supply airflow (except if 2 separate 0-10V signals are used to determine exhaust and supply constant airflows, see advanced setup).

- Starting/stopping the fan is carried out with knobs I/III and OFF.
- The pressure sensor is connected to entry K2 of the TAC4 DG circuit.
- By pressing knob III of the RC you activate the pre-set multiplier (% on K3).

a) Wiring to 1 circuit



b) Wiring to several circuits connected in parallel



(*) K2 ⇨0-10V signal, maximum impedance allowed: 1500 Ω

4.3.3.3 Operating LS mode with TAC4 DG master

The assignment value for the supply constant airflow is a function of a 0-10V signal connected to terminals K2 of the TAC4 DG circuit. The link between voltage and airflow is linear. The exhaust constant airflow is equal to %EXT/PUL of the supply airflow (except if 2 separate 0-10V signals are used to determine exhaust and supply constant airflows, see advanced setup).

- Starting/stopping the fans is carried out with entry K1 on the TAC4 DG circuit.
- The pressure sensor is connected to entry K2 of the TAC4 DG circuit.
- The K3 entry of the TAC4 DG can be used to activate the pre-set multiplier (% on K3).

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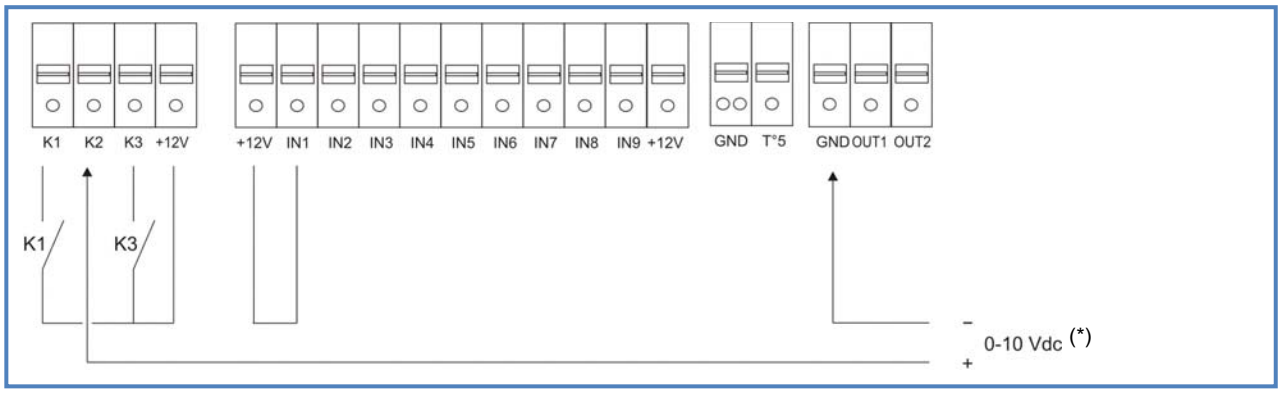
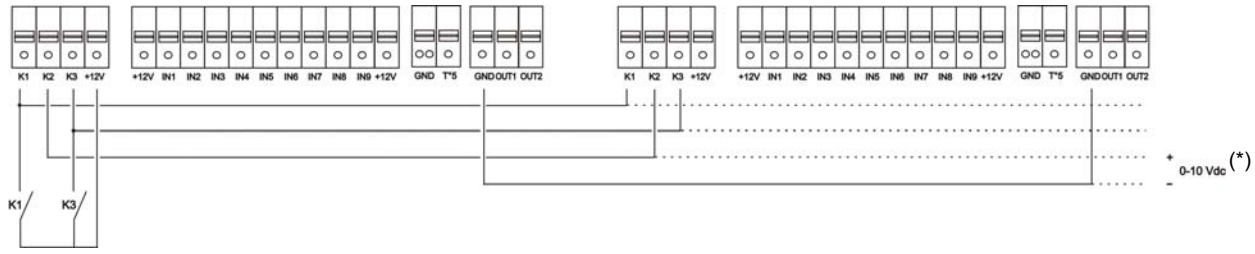
Wiring diagrams

a) Wiring to 1 circuit



b) Wiring to several circuits in parallel



(*)
K1 closed ⇨ soft start
K1 open ⇨ softstop
K2 ⇨ 0-10V signal, maximum impedance allowed: 1500 Ω
K1+K3 closed ⇨ % on K3 activated
K3 open ⇨ % on K3 inactive
Caution: use gold-plated contacts only.

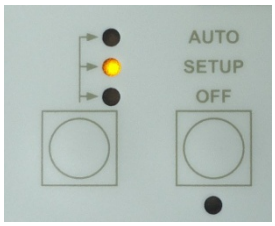
4.3.4 CPs mode: setup, operating instructions and wiring diagrams

4.3.4.1 Setup CPs mode

The setup is made by means of the LCD screen and the 4 knobs SETUP, ↑, ↓ and ENTER of the RC.

To start the setup:

- Enter in the setup mode using the left knob on the diagram so that the SETUP LED ignites. ⟶



- Press then the SETUP knob until the text 'SETUP' appears on the screen.

The idea is to select your choice with the ↑↓ knobs and then to confirm your choice by pressing 'ENTER'. The numbers are introduced digit by digit.

1	**LANGUAGE**	Choose your language (English, French, Dutch, German)
2	**HEATING T°? xx°C**	Only available with post-heating exhanger(s), Select the supply T° to the heating exhanger which is connected to the SAT BA.
3	**COOLING T°? xx°C**	Only available with post-cooling exhanger(s), Select the supply T° to the cooling exhanger which is connected to the SAT BA.
4	**WORKING MODE**	Select CPs from CA, LS, CPs
5	**CPs on SUPPLY**	Select 'constant pressure' on supply airflow (select SUPPLY), or on the exhaust airflow (select EXHAUST) or on both airflows (select SUP+EXH). If SUP+EXH is selected le setup jumps to step 8.
6	**% on K3?**	Input of multiplier on the CPs assignment when contact between terminals +12V and K3 in the TAC4 DG circuit is closed or if knob III is activated on the RC TAC4.
7	**%EXH/SUP**	Type in ratio between exhaust (EXH) and supply (SUP) airflow to create over, under or even pressure.
8	**TIME SEGMENT?N**	Select Y to activate the time segment scheduling function
9	**CONFIG TIME? N**	Select 'Y' to activate time segment function
10	**…**	For more details see § 3.4
11	**INIT CPS REF? N**	New initialization of the CPs constant pressure assignment ? Select Y to activate resetting of the pressure assignment .
12	**INIT via AIRFLOW?**	If Y is selected in 7 then select if you want to initialize the CPs reference automatically via the airflow or manually via the pressure value.

If INIT CPs via AIRFLOW (default): the maxi unit automatically determines the reference pressure		
13	**INIT SUP** **0000 m³h**	Enter nominal airflow to determine assignment pressure CPs (if SUPPLY or SUP+EXH was selected at step 5.).
14	**INIT EXH** **0000 m³h**	Enter nominal airflow to determine the pressure assignment CPs on the exhaust airflow (if EXHAUST or SUP+EXH was selected at step 5).
15	**INIT SUP** **xx,x V** **INIT SUP** **xxxx m³**	Initializing of CPs busy (if SUPPLY or SUP+EXH was selected at step 5). After 1 minute the system will memorize the pressure measured by the sensor corresponding to the nominal airflow. Display of the actual airflow of the supply fan and of the actual sensor value.
16	**INIT EXH** **xx,x V** **INIT EXH** **xxxx m³**	Resetting of CPs assignment on exhaust air busy (if EXHAUST or SUP+EXH was selected at step 5). After 1 minute the system will memorize the pressure measured by the sensor corresponding to the nominal airflow. Display of exhaust fan's actual airflow and of the sensor's actual value while resetting..
17	**ALARM** **RESET?**	Possibility to reset the alarms Y or N
18	**END SETUP**	The configuration of the system is finished.
If INIT via PRESSURE: enter pressure assignment value		
13	**SUP REF ?** **xx,x V**	Enter the pressure assignment value for the supply air (if SUPPLY or SUP+EXH was selected at step 5).
14	**EXH REF ?** **xx,x V**	Enter the pressure assignment value for the exhaust (if EXHAUST or SUP+EXH was selected at step 5).
15	**ALARM** **RESET?**	Possibility to reset the alarms Y or N
16	**END SETUP**	The configuration of the system is finished

CPs on SUPPLY air: The airflow delivered by the supply fans is automatically modulated to obtain a constant pressure as measured by the pressure sensor in the duct. The exhaust airflow is equals to %EXT/PUL of the supply airflow.

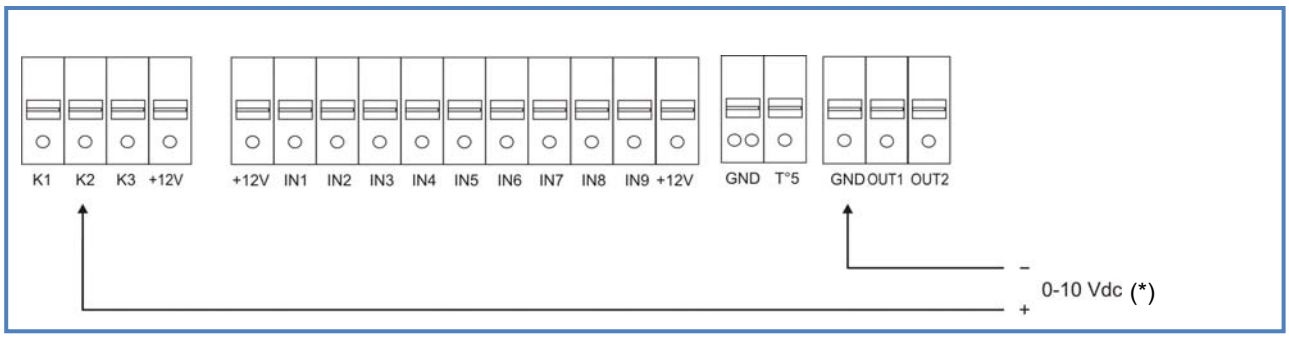
CPs on EXHAUST air: The airflow delivered by the exhaust fans is automatically modulated to obtain a constant pressure as measured by the pressure sensor in the duct. The supply airflow is equals to 1/(%EXT/PUL) of the exhaust airflow.

CPs on SUPLY + EXHAUST air: the supply fan's airflow is automatically modulated to obtain a constant pressure as it is measured by a pressure sensor connected to K2. And the exhaust t fan's airflow is automatically modulated to obtain a constant pressure as it is measured by a pressure sensor connected to K3.

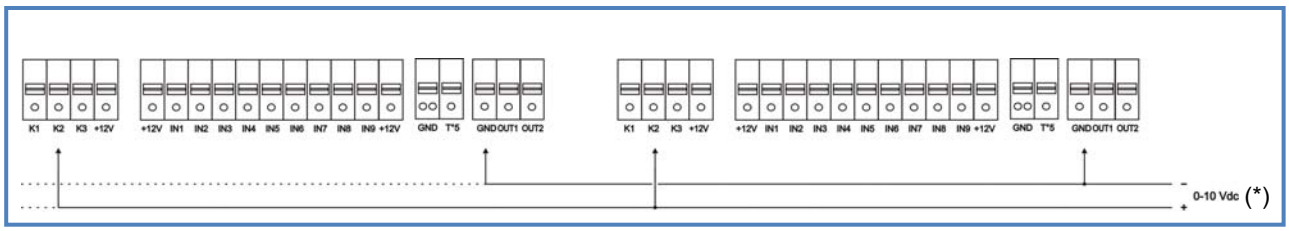
4.3.4.2 Operating CPs mode with RC TAC4 master

- The start/stop of the fans is controlled by knob I and OFF.
- The pressure sensor is connected to entry K2 of the TAC4 DG circuit. If CPs on SUPPLY+EXHAUST is selected, connect the supply air's pressure sensor on terminals K2 and GND, and the exhaust air's pressure sensor on terminals K3 et GND.
- The 'III' knob on the RC allows activating the airflow 'multiplier % on K3' on the airflow assignment.

a) Wiring to 1 circuit



b) Wiring to several circuits in parallel

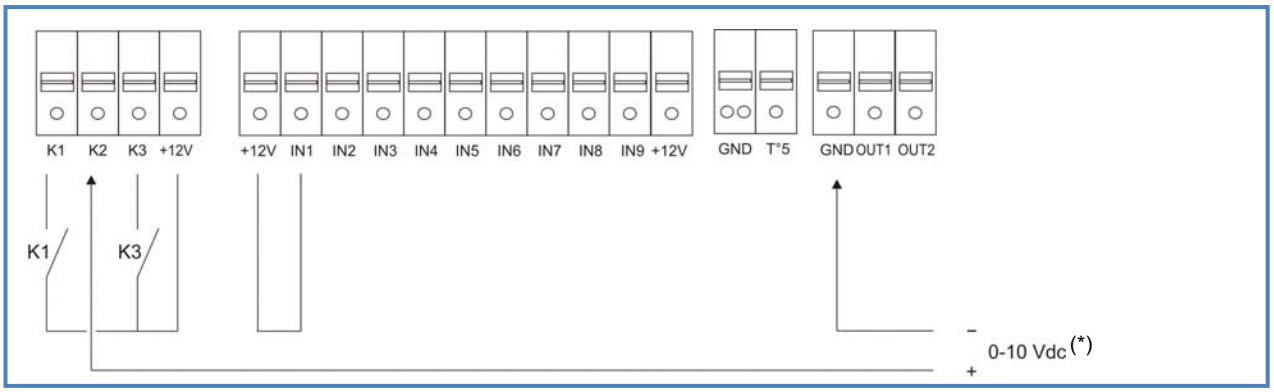


(*) K2 ⇨ 0-10V signal, maximum impedance allowed: 1500 Ω

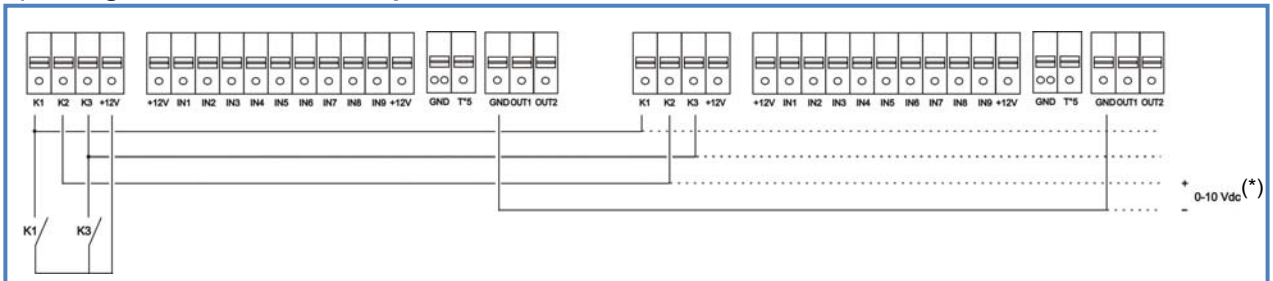
4.3.4.3 Operating CPs mode with TAC4 DG master

- The start/stop of the fans is controlled by entry K1 of the TAC4 DG circuit.
- The pressure sensor is connected to entry K2 of the TAC4 DG circuit.
- K3 on the TAC4 DG circuit can be used to activate the multiplier '% on K3' on the airflow assignment

a) Wiring to 1 circuit



b) Wiring to several circuits in parallel


K1 K2 K3 +12V
+12V IN1 IN2 IN3 IN4 IN5 IN6 IN7 IN8 IN9 +12V
GND T°S
GND OUT1 OUT2
K1 K2 K3 +12V
+12V IN1 IN2 IN3 IN4 IN5 IN6 IN7 IN8 IN9 +12V
GND T°S
GND OUT1 OUT2
K1
K3
0-10 Vdc(*)

(*)
K1 closed ⇨ soft start
K1 open ⇨ softstop
K2 ⇨ 0-10V signal, maximum impedance allowed: 1500 Ω
K1+K3 closed ⇨ % on K3 activated
K3 open ⇨ % on K3 inactive
Caution: use gold-plated contacts only

4.4 Time slots schedules

4.4.1 Definition

Die The TAC4 DG regulation allows to configure 4 time slots (TS) and to set OFF days.
For each time slot select:

- In CA mode: which airflow by selecting m³h K1 / m³h K2 / m³h K3 / OFF (stop)
- In LS mode: ON / OFF
- In CPs mode: ON / OFF

And for each day of the week select : AUTO / OFF (operate as a normal day or as an OFF day)

4.4.2 Configuration

…	…	…
1	**CONFIG TIME? N**	Select 'Y' to activate time segment function
2	**SET TIME xx:xx**	Enter time
3	**SET DATE xx/xx/xx**	Enter date
4	**TIME SEGMENT? N**	Select 'Y' to activate time segment function
If CA mode		
5	**TIME 1: --:--**	Enter TS1 starting time. If empty time slot is inactive.
6	**SUPPLY 0000 m³h**	For TS1, enter supply airflow (0000 = fan stop)
7	**EXHAUST 0000 m³h**	For TS1, enter exhaust airflow (0000 = fan stop)
8	**TIME 2: -- :--**	Enter TS2 starting time. If empty time slot is inactive.
9	**SUPPLY 0000 m³h**	For TS2, enter supply airflow (0000 = fan stop)
10	**EXHAUST 0000 m³h**	For TS2, enter exhaust airflow (0000 = fan stop)

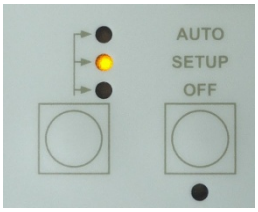
11	**TIME 3:** **-- :--**	Enter TS3 starting time. If empty time slot is inactive.
12	**SUPPLY** **0000 m³h**	For TS3, enter supply airflow (0000 = fan stop)
13	**EXHAUST** **0000 m³h**	For TS3, enter exhaust airflow (0000 = fan stop)
14	**TIME 4:** **-- :--**	Enter TS4 starting time. If empty time slot is inactive.
15	**SUPPLY** **0000 m³h**	For TS4, enter supply airflow (0000 = fan stop)
16	**EXHAUST** **0000 m³h**	For TS4, enter exhaust airflow (0000 = fan stop)
If LS mode		
5	**TIME 1:** **--:--**	Enter TS1 starting time. If empty time slot is inactive.
6	**SET VAL.** **LS 000%**	For TS1, enter coefficient (%) applied to the base link configured between V value and airflow value (cfr m³/h≡Vmin and m³/h≡Vmax in setup). Select 000 to stop both supply and exhaust fans.
7	**%EXH/SUP** **100 %**	For TS1, select airflow ratio between exhaust (fans F3,F4) and supply (Fans F1,F2) airflows.
8	**TIME 2:** **--:--**	Enter TS2 starting time. If empty time slot is inactive.
9	**SET VAL.** **LS 000%**	For TS2, enter coefficient (%) applied to the base link configured between V value and airflow value (cfr m³/h≡Vmin and m³/h≡Vmax in setup). Select 000 to stop both supply and exhaust fans.
10	**%EXH/SUP** **100 %**	For TS2, select airflow ratio between exhaust (fans F3,F4) and supply (Fans F1,F2) airflows.
11	**TIME 3:** **--:--**	Enter TS3 starting time. If empty time slot is inactive.
12	**SET VAL.** **LS 000%**	For TS3, enter coefficient (%) applied to the base link configured between V value and airflow value (cfr m³/h≡Vmin and m³/h≡Vmax in setup). Select 000 to stop both supply and exhaust fans..
13	**%EXH/SUP** **100 %**	For TS3, select airflow ratio between exhaust (fans F3,F4) and supply (Fans F1,F2) airflows.
14	**TIME 4:** **--:--**	Enter TS4 starting time. If empty time slot is inactive.
15	**SET VAL.** **LS 000%**	For TS4, enter coefficient (%) applied to the base link configured between V value and airflow value (cfr m³/h≡Vmin and m³/h≡Vmax in setup). Select 000 to stop both supply and exhaust fans.
16	**%EXH/SUP** **100 %**	For TS4, select airflow ratio between exhaust (fans F3,F4) and supply (Fans F1,F2) airflows.
If CPs mode on supply OR exhaust		
5	**TIME 1:** **--:--**	Enter TS1 starting time. If empty time slot is inactive.
6	**SET VAL.** **CPs 000%**	For TS1, enter coefficient (%) applied to the pressure assignment defined in the basic setup. Select 000 to stop both supply and exhaust fans.

7	**%EXH/SUP 100 %**	For TS1, select airflow ratio between exhaust (fans F3,F4) and supply (Fans F1,F2) airflows.
8	**TIME 2: --:--**	Enter TS2 starting time. If empty time slot is inactive.
9	**SET VAL. CPs 000%**	For TS2, enter coefficient (%) applied to the pressure assignment defined in the basic setup. Select 000 to stop both supply and exhaust fans.
10	**%EXH/SUP 100 %**	For TS2, select airflow ratio between exhaust (fans F3,F4) and supply (Fans F1,F2) airflows.
11	**TIME 3: --:--**	Enter TS3 starting time. If empty time slot is inactive.
12	**SET VAL. CPs 000%**	For TS3, enter coefficient (%) applied to the pressure assignment defined in the basic setup. Select 000 to stop both supply and exhaust fans.
13	**%EXH/SUP 100 %**	For TS3, select airflow ratio between exhaust (fans F3,F4) and supply (Fans F1,F2) airflows.
14	**TIME 4: --:--**	Enter TS4 starting time. If empty time slot is inactive.
15	**SET VAL. CPs 000%**	For TS4, enter coefficient (%) applied to the pressure assignment defined in the basic setup. Select 000 to stop both supply and exhaust fans.
16	**%EXH/SUP 100 %**	For TS4, select airflow ratio between exhaust (fans F3,F4) and supply (Fans F1,F2) airflows.
If CPs mode on SUPPLY+EXHAUST		
5	**TIME 1: --:--**	Enter TS1 starting time. If empty time slot is inactive.
6	**CPs on SUP 100%**	For TS1, enter coefficient (%) applied to the supply pressure assignment defined in the basic setup. Select 000 to stop both supply and exhaust fans.
7	**CPs on EXH 100%**	For TS1, enter coefficient (%) applied to the exhaust pressure assignment defined in the basic setup. Select 000 to stop both supply and exhaust fans.
8	**TIME 2: --:--**	Enter TS2 starting time. If empty time slot is inactive.
9	**CPs on SUP 100%**	For TS2, enter coefficient (%) applied to the supply pressure assignment defined in the basic setup. Select 000 to stop both supply and exhaust fans.
10	**CPs on EXH 100%**	For TS2, enter coefficient (%) applied to the exhaust pressure assignment defined in the basic setup. Select 000 to stop both supply and exhaust fans.
11	**TIME 3: --:--**	Enter TS3 starting time. If empty time slot is inactive.
12	**CPs on SUP 100%**	For TS3, enter coefficient (%) applied to the supply pressure assignment defined in the basic setup. Select 000 to stop both supply and exhaust fans.
13	**CPs on EXH 100%**	For TS3, enter coefficient (%) applied to the exhaust pressure assignment defined in the basic setup. Select 000 to stop both supply and exhaust fans.
14	**TIME 4:**	Enter TS4 starting time. If empty time slot is inactive.

	--:--	
15	**CPs on SUP 100%**	For TS4, enter coefficient (%) applied to the supply pressure assignment defined in the basic setup. Select 000 to stop both supply and exhaust fans.
16	**CPs on EXH 100%**	For TS4, enter coefficient (%) applied to the exhaust pressure assignment defined in the basic setup. Select 000 to stop both supply and exhaust fans.
For all working modes		
17	**DAY OFF N**	Select Y if you wish to activate the day OFF option
18	**MONDAY AUTO**	If DAY OFF option activated : for MONDAYs select AUTO (normal time slots setup is active) or OFF (no ventilation on Monday)
19	**TUESDAY AUTO**	If DAY OFF option activated : for TUESDAYs select AUTO (normal time slots setup is active) or OFF (no ventilation on Monday)
20	**WEDNESDAY AUTO**	If DAY OFF option activated : for WEDNESDAYs select AUTO (normal time slots setup is active) or OFF (no ventilation on Monday)
21	**THURSDAY AUTO**	If DAY OFF option activated : for THURSDAYs select AUTO (normal time slots setup is active) or OFF (no ventilation on Monday)
22	**FRIDAY AUTO**	If DAY OFF option activated : for FRIDAYs select AUTO (normal time slots setup is active) or OFF (no ventilation on Monday)
23	**SATURDAY AUTO**	If DAY OFF option activated : for SATURDAYs select AUTO (normal time slots setup is active) or OFF (no ventilation on Monday)
24	**SUNDAY AUTO**	If DAY OFF option activated : for SUNDAYs select AUTO (normal time slots setup is active) or OFF (no ventilation on Monday)
…	…	…

4.4.3 Use

To shift from **manual** mode (airflow selection by selecting OFF - I - II - III) to **automatic** mode (airflow selection per timeslots), press selection knob (left on picture) until LED 'AUTO' is lit.



4.5 Alarms

4.5.1 Alarm types

Type 1: Alarm indicating a fan failure.
This alarm indicates a failure of fan Fx.
This problem is usually caused by the motor. If not, the failure can be caused by an internal cable or by the TAC4 DG circuit.

See **1** in table 4.5.2 below

Type 2: Alarm on the pressure variation (CA and LS modes only).
This alarm indicates a pre-established pressure level has been reached on fan Fx.
Pressure alarm setup in CA or LS mode (see § 4.3.2.1 and 4.3.3.1):

	PRESSURE ALARM?	The pressure alarm is optional. If you do not wish it select N and skip to step 16. Otherwise select Y.
	ΔP SUP	Type in the pressure increment for the supply airflow.
	ΔP EXH	Type in the pressure increment for the exhaust airflow.
	INIT Pa REF?	Do you wish to (re-)configure the reference pressure for the supply and the exhaust airflows ? Y or N. (this is optional if it has been done previously)
	m³h INIT	If Y is selected, enter nominal airflow at which you wish to initialize the reference pressure. (same airflow for exhaust and supply air)
	Pa REF INIT **xxxx m³h** **xxxx Pa**	Initializing the reference pressure… After +/-1 minute, the system will memorize the calculated pressure value of the fan as the reference pressure. While initializing the airflow and pressure on F1 is displayed.

See **2** in table below.

Type 3: Alarm indicating a problem while initializing reference pressure for a pressure alarm.

4 possibilities:

- Actual airflow < requested airflow : The requested working point is 'too high' (too much pressure) for the maximal available pressure at the requested airflow for this fan.
- Actual airflow > requested airflow: the nominal airflow requested to initialize the pressure alarm cannot be reached because the lower limit of the fan's operating zone has been reached.
- Very unstable pressure (pumping).
- Assigned airflow not reached after 3 minutes.

See **3** in table below.

$Pa_{réf}$ cannot be identified and the fans are stopped.
Press 'RESET' using 'SETUP' on the RC TAC4, or with the 'RESET' key on the TAC4 DG circuit.
- If it occurs during initializing an alarm pressure 2 options: 1. No action is taken: the control will operate without pressure alarm 2. Corrective action is taken (change the working point to one well located in the working zone of the fan, by reducing the pressure system, modifying the nominal airflow,…) and restart the setup operation.
- If it occurs during initializing of the assignment pressure in CPs mode : A corrective action must be taken (change the working point to one well located in the working zone of the fan, by reducing the pressure system, modifying the nominal airflow, …) and restart the setup operation.

Type 4: Alarm indicating the system cannot fulfill the assignment.

The assignment (keeping certain airflow or a certain pressure constant) cannot be fulfilled because the upper or lower limit of the fan's working zone has been reached.

See **4** in table below.

Type 5: Alarm indicating a data failure in the control circuit
Crucial data from the circuit board has been lost. Try a TOTAL RESET of the data using the advanced setup.
If still not solved send the defect TAC4 DG circuit for reprogramming.

See **5** in table below.

Type 6: Fire Alarm with an external contact connected to a fire detection system.

See **6** in table below. For more details see § 4.5.4.

After a fire alarm it is necessary to perform a RESET (via the SETUP of the RC TAC4 or the RESET button on the TAC4 DG circuit to return to normal operation).

Type 7: Alarm indicating maintenance is expected. (for configuration see "advanced setup)
SERVICE ALARM: indicates the fan operating time (in hours) has exceeded a certain limit set during the configuration.
STOP FAN: indicates the fan operating time (in hours) has exceeded a certain limit set during the configuration.
This alarm stops the fans.

See **7** in table below.

Type 8: Alarm indicating a communication breakdown between the TAC4 DG circuit and the RC TAC4.
This alarm indicates a communication problem between the 2 modules of the TAC4 DG regulation.

See **8** in table below.

Type 9: Alarm indicating a T° sensor T1/T2/T3 failure.
One or more of the T° sensors T1/T2/T3 connected to the TAC4 DG circuit and mounted on heat exchanger is defect or not connected. These sensors are crucial for the by-pass control and the antifrost procedure.
After correction of the failure press 'RESET' with SETUP of the RC TAC4, or press 'RESET' on the TAC4 DG circuit.

See **9** in table below.

Type 10: Alarm indicating failure on T° sensor T4 (only with NV option).
It indicates that the T° sensor T4 located on the coil and connected to the TAC4 DG circuit is defect (open or short circuit) or not connected. This sensor is used to avoid frosting of the NV coil. In this case, as a safety measure, the 3 way valve is opened and the contact used to start the circulator is closed.
After fixing the failure, press 'RESET' with SETUP of the RC TAC4, or press RESET on the TAC4 DG circuit.

See **10** in table below.

Type 11: Alarm indicating failure on T° sensor T5 (only with NV option or KWout).
It indicates a failure of the T° sensor T5 located in the supply duct and connected to the TAC4 DG circuit (opened or short circuit) or that it is not connected. This sensor is used to regulate the post-heating function.
After fixing the failure, press 'RESET' with SETUP of the RC TAC4 or press RESET on the TAC4 DG circuit.

See **11** in table below.

Type 12: Alarm indicating that the assigned T° cannot be reached (only with NV option or KWout).
If the actual T° is lower than the assigned T° for more than 15 minutes with the post-heating fully opened until)

See **12** in table below.

Type 13 et 14: Alarm indicating antifrosting alert (only with KWin option).
In certain air T° conditions as measured on the exhaust airflow after the heat recovery, indicating that the Kwin has reached its limit, the TAC4 DG control can take over to guarantee the antifrost function.

a) Alarm type 13: If T° < assignment T°-1,5°C for more than 5 minutes: supply and exhaust airflow reduction of 33% if CA or LS and of 25% if CPs, for 15 minutes.

b) Alarm type 14: If T° < -5°C during 5 minutes, fans are stopped. Press 'RESET' with SETUP of the RC TAC4, or press RESET on the TAC4 DG circuit to restart the unit.

See **13 & 14** in table below.

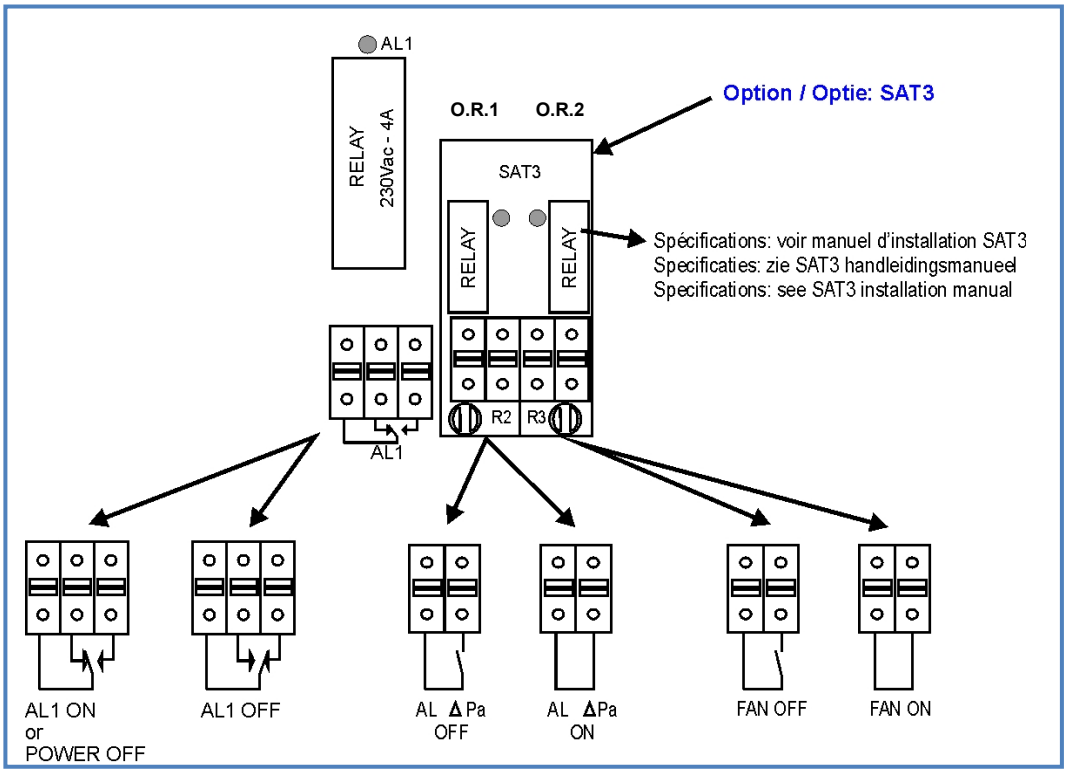
4.5.2 Alarm table

	Actions on RC TAC4			Actions on the TAC4 DG circuit				Action on fans
Type	**Display (1)**	**LED ALARM**	**LED Pa**	**LED ALARM**	**AL1 relay**	**R2 relay of SAT3 (O.R.1)**	**LED AF**	
1	**ALARM FANx**	Red	/	ON	Alarm status	/	/	Stopped
2	**PRESSURE ALARM**	/	Red	ON	/	Closed	/	/ (2)
3	**ALARM INIT Pa**	Red	/	ON	Alarm status	/	/	Stopped
4	**ALARM CA, LS or CP**	/	/	ON	/	/	/	/
5	**DATA ERROR**	Red	/	ON	Alarm status	/	/	Stopped
6	**FIRE ALARM**	Red	/	ON	Alarm status	/	/	(3)
7	**ALARM SERVICE** **FAN STOP SERVICE**	Red Red	/ /	ON ON	Alarm status Alarm status	/ /	/ /	/ Stopped
8	**CB COM ERROR**	Red	/	/	Alarm status	/	/	/
9	**ALARM T° SENSOR 1/2/3**	Red	/	ON	Alarm status	/	/	Stopped
10	**ALARM T° SENSOR 4**	Red	/	ON	Alarm status	/	/	/
10bis	**DRAIN ALARM**	Red	/	ON	Alarm status	/	/	Stopped
11	**ALARM T° SENSOR 5**	Red	/	ON	Alarm status	/	/	/
12	**ALARM POSTHEAT T° TOO LOW**	Red	/	ON	/	/	/	/
13	**AF T° ALARM AIRFLOW REDUCED**	Red	/	ON	/	/	ON	Reduced
14	**AF T° ALARM STOP FANS**	Red	/	ON	Alarm status	/	Blinking	Stopped

/ = no action

(1) Detailed text is displayed in successive screens..
(2) Unless the status has been changed in advanced setup to stop the fans.
(3) See details in § 4.5.4

4.5.3 Wiring diagrams



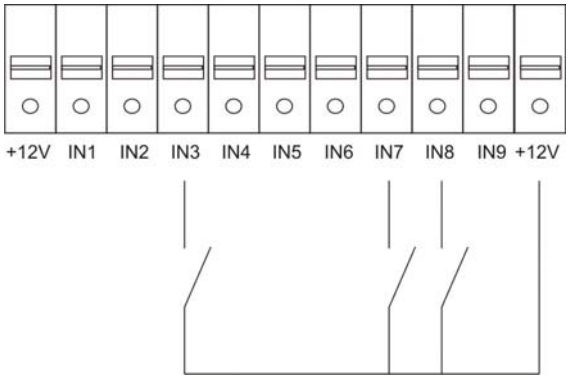
4.5.4 Fire alarm

The TAC4 DG control can be connected to a fire detection system to:
- stop/start the supply/exhaust fans according to fire regulations
- set the airflows in case of fire alarms according to fire regulations
- allow firemen to overrule the existing setup and start/stop the fans as needed.

4.5.4.1 Configuration

The supply / exhaust airflow configuration is made using the advanced setup

4.5.4.2 Wiring diagram of fire alarm



If IN3 12V closed = fire alarm activated (this logic can be reversed via advanced setup menu).
Default, if IN3 – 12 V closed and :

- IN7 - 12V closed = force start the supply fan(s) at pre-programmed airflow (1).
- IN7 - 12V open = force stop the supply fan(s).
- IN8 - 12V closed = force start the exhaust fan(s) at pre-programmed airflow (1).
- IN8 – 12V open = force stop the exhaust fan(s).

(1) At preset airflow in the advanced setup menu

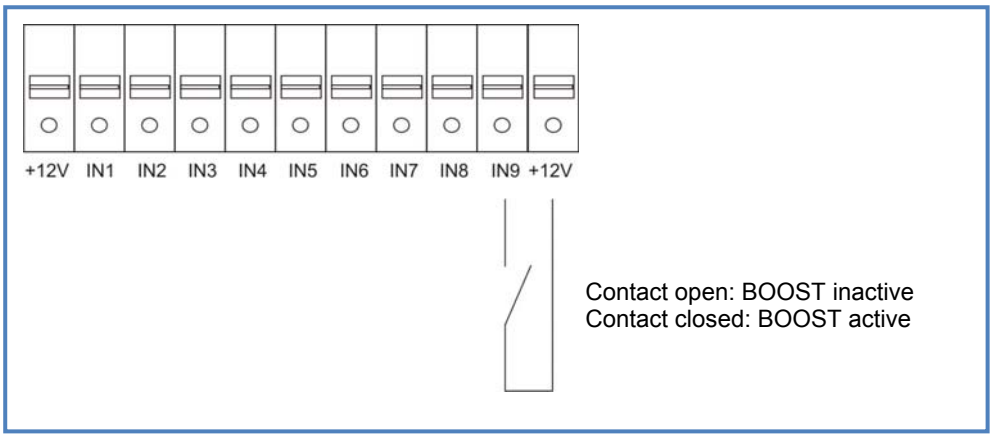
4.6 BOOST function

The BOOST function allows forcing a preset airflow overruling all other configurations..

4.6.1 Setup

The configuration is made via the advanced setup.

4.6.2 Wiring diagram



4.7 BYPASS function (free cooling)

The counter flow heat exchanger is fitted with a 100% bypass. When the bypass is open fans may:
- Either continue to operate the same way as when the bypass is closed.
- Either operate at a fixed exhaust and supply airflow rate. These airflow values can be (re)set via the SETUP AVANCE.

According to inside and outside temperatures, the TAC4 DG control will monitor the opening/closing of the 100% by-pass damper. The by-pass is delivered completely wired and motorized from factory. No wiring or installation is required by the installer. The O.R.4 relay (SAT3 option) of the TAC4 DG circuit indicates the opening / closing of the bypass.

4.7.1 Operating description

- **Opening of 100% by-pass** if all following conditions are met:
  - Outside T° (sensor T1) < inside T° (sensor T2) – 1K.
  - Outside T° (sensor T1) > 15°C
  - Inside T° (sensor T2) > 22°C.

- **Closing of 100% by-pass** if one of the following conditions is met:
  - Outside T° (sensor T1) > inside T° (sensor T2).
  - Outside T° (sensor T1) < 14°C
  - Inside T° (sensor T2) < 20°C.

All these temperature SET values can be modified using ADVANCED SETUP

When the bypass is open, the pressure alarm is deactivated. For the maxi 4002 and maxi 6002 models the maximum airflow when the bypass is open is reduced respectively at 3500 m³/h and 5300 m³/h. For the other models, there is no reduction of the maximum airflow when the bypass is open.

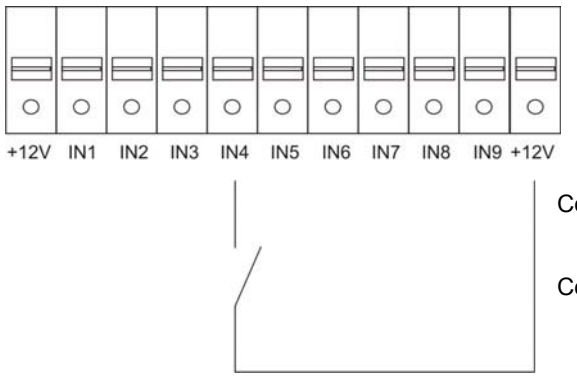
4.7.2 Additional function

When the bypass is open fans may:

- Either continue to operate the same way as when the bypass is closed.
- Either operate at a fixed exhaust and supply airflow rate. These airflow values can be (re)set via the SETUP AVANCE.

4.7.3 Wiring diagram

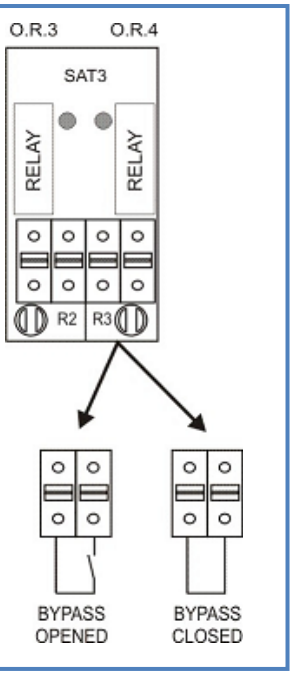
Opening of the bypass can be forced whatever the T° (with an external contact):



Contact open: automatic bypass operation in function of T1, T2 and setup values.

Contact closed: bypass is open whatever T1 and T2 values

Bypass status :



4.8 Opening / closing of dampers (CT option) at inlet

The opening and closing of (a) damper(s) mounted at both supply and exhaust air inlets are automatically managed by the TAC4 DG regulation.
The actual fan startup is delayed to allow prior opening of dampers. When fans are stopped the dampers are closed.

4.9 Heat exchanger antifrost protection system

There is a risk of frosting the heat exchanger in the exhaust airflow. Two antifrost protection systems are available:

- Supply air volume reduction (less cooling capacity)

- Modulation of capacity of an electrical coil located before the inlet air enters the heat exchanger (KWin option)

4.9.1 Protection antifreeze via pulse flow reduction

This functionality is built in the standard TAC4 DG and must not be configured by the installer. It is automatically de-activated if an optional KWin pre-heater (see § 4.9.2) is installed in the unit.

Description:

In order to avoid the risk of frosting the heat exchanger, the supply airflow is linked to the temperature value of the exhaust airflow measured after the heat exchanger (sensor T3).

- T°(T3) > +3°C: the assigned airflow is as defined by SETUP.

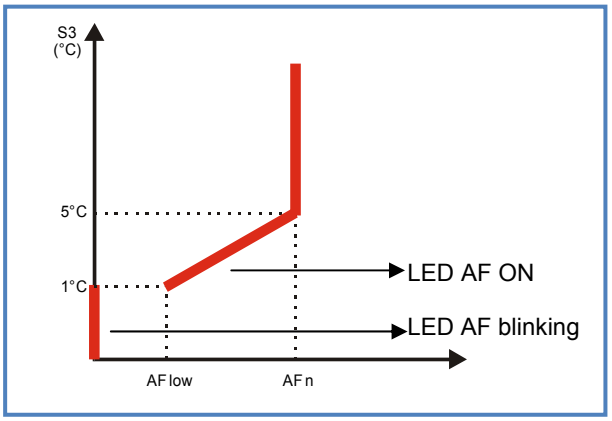
- 0°C < T°(T3) < +3°C : the airflow assigned by SETUP is automatically modified as follows:
  - If CA or LS working mode : the supply airflow will progressively drop down to 33% (AF_{low}) of the assigned airflow (AF_n)
  - If CPs mode, the assigned pressure will drop to 50% (AF_{low}) of the assigned pressure (AF_n)

  In these conditions LED AF is ON.

- T°(T3) < 0°C : the supply airflow is stopped for as long as T°(T3) < +1°C during 5 minutes. In these conditions LED AF is blinking.

All these temperature SET values can be modified using ADVANCED SETUP.

Antifreeze diagram:



4.9.2 Antifrosting the heat exchanger with 1 pre-heating KWin (option)

If a KWin pre-heating coil is option is installed in the maxi unit the heat exchanger is protected from frosting by a modulating electrical coil assigned to maintain a pre-set temperature at the outlet of the heat exchanger, in the exhaust airflow.
The KWin is delivered ready to use from the factory. The default assignment T° after heat exchange is 1°C. If necessary this value can be changed using the advanced setup feature

TAC4 DG regulation antifrost functions:

- A solid state relay controlled by the TAC4 DG regulation controls the coil's capacity in function of the assigned T° and of resulting exhaust T°.

- The control only allows the heating coil to be operated if the supply fans are in working. This wiring is factory made.

- Post-ventilation feature (see advanced setup):

If the fans are requested to stop, the R3 relay is opened, and therefore the power supply to the coils is also shut down. The fans continue running for 90 seconds to insure post-ventilation of the electrical coils.

- If conditions make that the pre-heating coil KWin does not deliver enough capacity to reach the 'floor T°' assignment, and therefore not insuring the anti-frost duty, the control will modulate the in and out airflows as follows:

  a) If T° < -1°C and T° < (floor T° - 1,5°C), for more than 5 minutes:

  If CA and LS mode: reduction of in and outgoing airflows to 66% of the assigned airflows.
  If CPs Mode: reduction to 75% of the assigned pressure.
  This setup is maintained during 15 minutes, after which the 100% airflow/pressure assignment is reestablished.

Actions on RC			Actions on TAC4 DG circuit				Action on fans
Display text	**LED ALARM**	**LED Pa**	**LED ALARM**	**AL1 Relay**	**R2 Relay on SAT3 (O.R.1)**	**LED AF**	
AF T° ALARM REDUCED AIRFLOW	RED	/	ON	/	/	ON	Assignment reduction

b) If T° < -5°C during 5 minutes the unit is stopped:

Actions on RC			Actions on TAC4 DG circuit				Action on fans
Display text	**LED ALARM**	**LED Pa**	**LED ALARM**	**AL1 Relay**	**R2 Relay on SAT3 (O.R.1)**	**LED AF**	
AF T° ALARM STOP FANS	RED	/	ON	Alarm status	/	Blink	Stopped

Restart is made by resetting (by pressing the RESET knob on TAC4 DG circuit or via the RC TAC4).

4.10 KWout post heating electrical coil control (option)

The post-heating coil is delivered factory mounted.

Its purpose is to keep a constant supply air temperature, using the TAC4 DG regulation.

The assigned T° is configured according to selected working mode, (see § 4.3.2.1, 4.3.3.1 or 4.3.4.1).

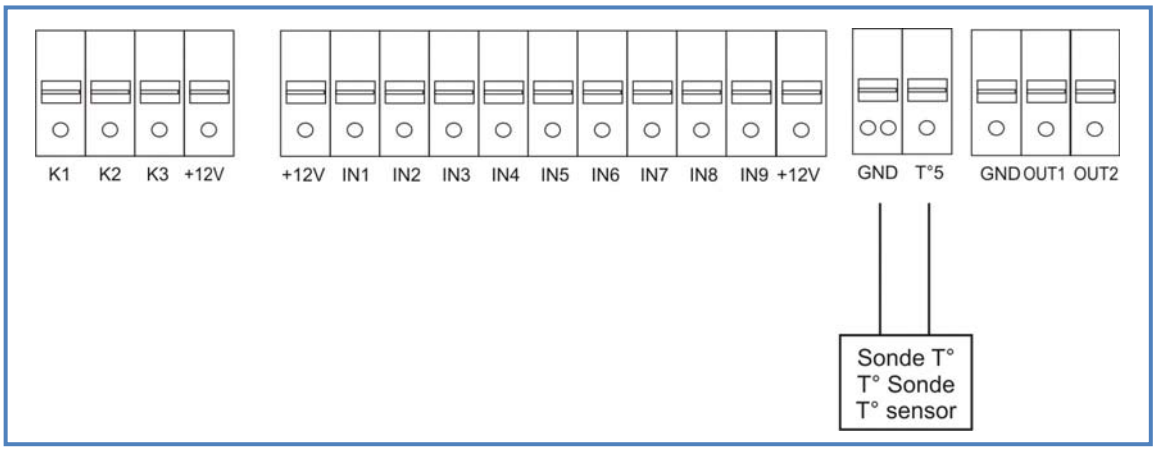
	…	
	SUPPLY? xx°C KWo	If a post-heating coil is present (option) type in set point T ° for supply air
	…	

Features provided by the TAC4 DG regulation:

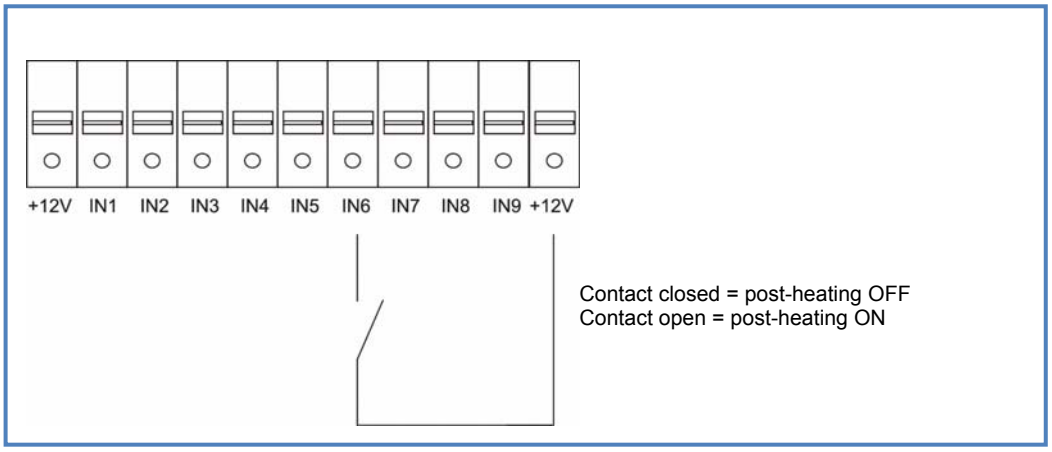
- Regulation of static relay of the electric coil in function of assigned supply T° and actual measured supply T°.
- To avoid overheating, regulation checks if fans are operating before supplying electric coil. This is factory pre-wired.
- A post-ventilation of the coil function is available (see advanced configuration): When fans are requested to stop, first the electrical coils are shut down, then the fan operate for 90 seconds (minimum value) before stopping. This feature cools the coils before actually stopping the fans.
- It is possible to stop the post heating with an external contact (IN6 - see detail in the § 4.10.1).
- Set point alarm: see details in section § 4.5.1 and 4.5.2
- Sensor alarms: see details in section § 4.5.1 and 4.5.2

4.10.1 Wiring diagrams

- Wiring the supply T° sensor to the TAC DG board:



- Possibility to stop the post-heating with an external contact:



4.11 Post heating (NV option) regulation

The post heating coil is delivered pre-wired.
The 3way valve is delivered unmounted.
The NV option on the TAC4 DG regulation allows maintaining a pre-set supply T° constant.
The assignment T° is set using the configuration menu (see § 4.3.2.1, 4.3.3.1 or 4.3.4.)1 according to the selected working mode.

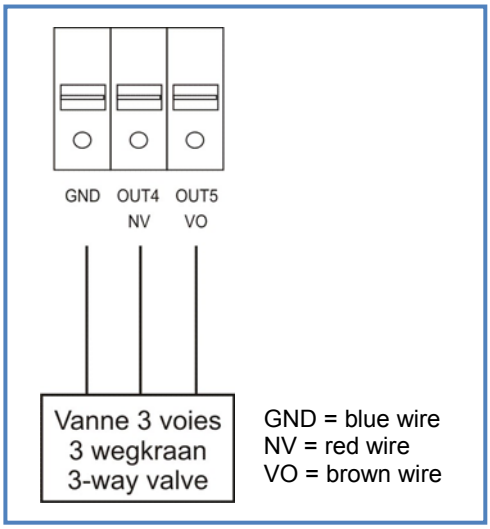
	…	
	SUPPLY? xx°C NV	If a post-heating water coil (NV option) is present in the unit, type in supply air assignment T°
	…	

Control features of the TAC4 DG :

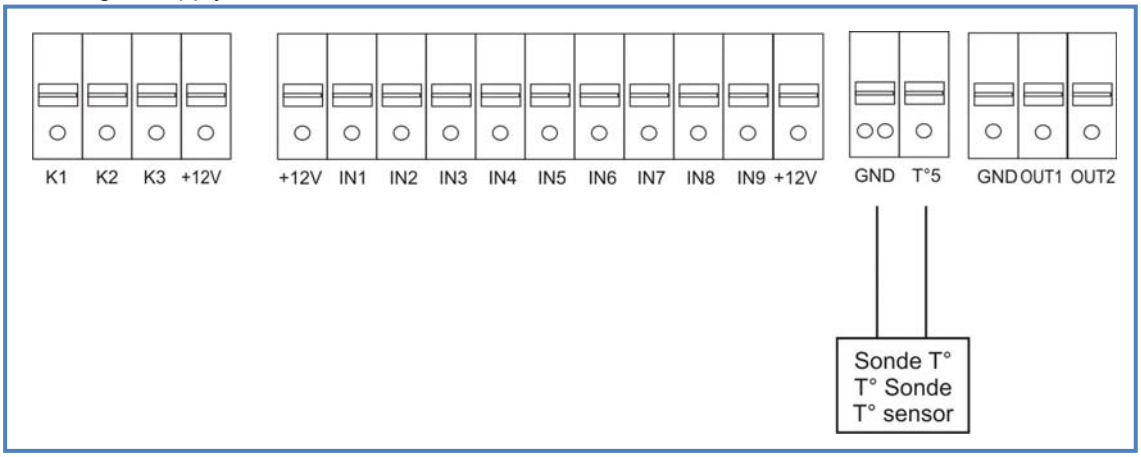
- Monitoring the 3-way valve to keep assignment T° constant using supplied sensor T° value.
- Engaging a relay to start a water circulator (output SAT 3 O.R.3 on i/o module - see § 4.11.1)
  Antifrost protection of the water coil based on the value of T4 (T° sensor provided and pre-wired). If value T4 <4°C then the 3 way valve is opened and contact for circulator is closed during 15 minutes.
- Possibility to stop the post-heating with an external contact connected to terminal (IN6) (see §3.11.1).
- Assignment failure: see § 4.5.1 and 4.5.2
- Sensor failure alarm : see § 4.5.1 and 4.5.2

4.11.1 Wiring diagram of the 3 way valve

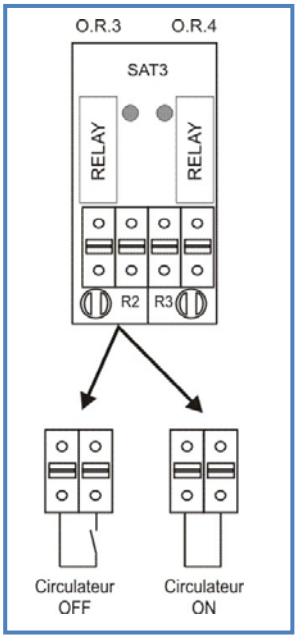
- 3 ways valve wiring to TAC DG circuit:



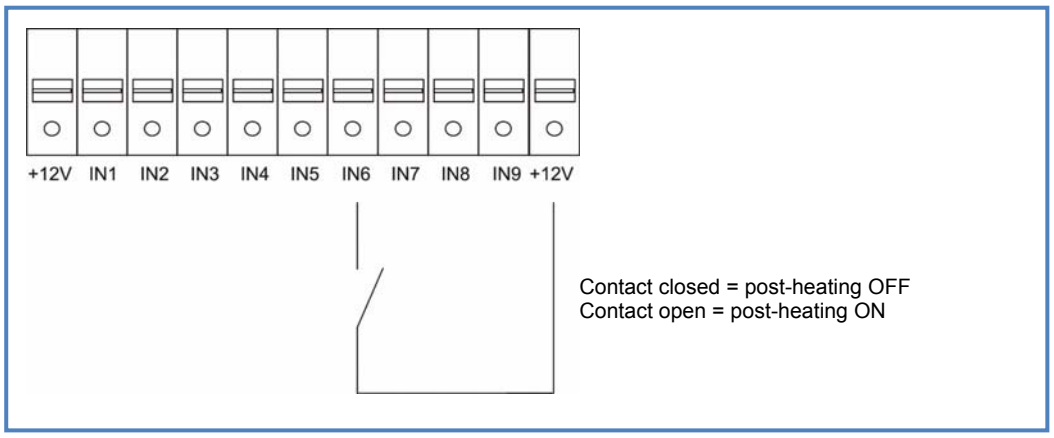
- Wiring of supply air T° sensor to TAC DG circuit



- Switching of a relay to control the circulator (SAT3 O.R.3 relay):



- Possibility to stop the post-heating with an external contact



4.12 Regulation for external coil(s) (SAT TAC4 BA/KW option)

Via option SAT TAC4 BA/KW it is possible to control one or two external (from the unit) heat exchanger(s):
- One heating coil
- One water cooling coil
- One heating/cooling coil (reversible coil)
- One heating coil + one cooling coi (separate)
- One electrical coil
- One electrical coil + one cooling coil

SAT TAC4 BA/KW
- Controls the coil's capacity by keeping a supply air temperature constant, equals to the assignment. This assignment can be defined for each coil when configuring the setup.
- Controls the water coils antifrost protection
- Triggers command for circulator(s)
- Cooling/Heating mode control by digital entry. (An extra external system determining in which mode (heat/cool) the coil must operate and delivering the information (free of potential contact) to the SAT TAC4 BA/KW is necessary).
- Allows shutting down the coils via digital input.

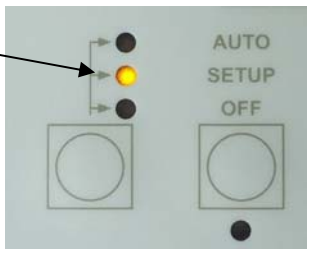
4.13 Display on the RC TAC4

a) Standard display

By default, only airflow and fan pressure values as well as alarm status are displayed on the LCD.

b) Display all the parameters

Press on the left knob on the diagram so that the SETUP LED ignites

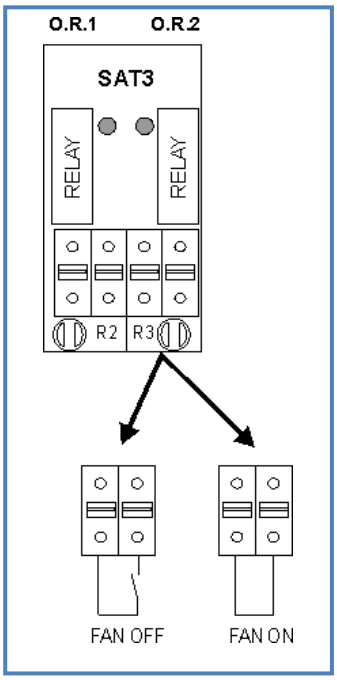


By pressing ↑ and ↓ it is possible to display the status of all the working parameters:
- maxi type and built in options (CT, pre/post heating)
- working mode and set values
- airflow/pressure of each fan
- pressure alarm setup (CA/LS working mode only)
- alarm status
- status of K1/K2/K3/IN1/IN2/IN3/IN4/IN5/IN6/IN7/IN8/IN9 inputs
- status of the bypass
- status of the anti-freeze protection
- T° values of sensors 1/2/3/4/5 (4 and 5 = options)
- status of the CT (option)

4.14 Fan failure alarm

It is possible with a SAT3 mounted on the TAC4 DG (option) to provide the fan status (control if actual delivered airflow > 20% of airflow assignment) or if they are stopped, using the R3 relay of one of the SAT3 (O.R.2). This feature provides an increased safety with regard to the start instruction control, because there is a control on the fact that the fan is actually running (closed loop principle).

Wiring diagram:



4.15 Actual airflow / pressure output signals

A 0-10V signal representing the actual airflow or the actual pressure delivered by one of the selected fans with a linear relation is a standard feature.

The output signals are located between terminals OUT1/OUT2 and GND on the TAC4 DG circuit.

Default setup : OUT1 = airflow fan 1 (supply fan) and OUT2 = pressure fan 1 (supply fan).

Table link between 0-10V signal and actual pressure or airflow value. (Linear equation):

Maxi-series

	maxi 802	maxi 1202	maxi 2002	maxi 3002	maxi 4002	maxi 5002	maxi 6002
	528007180	52800718020	528007200	528007210	528007220	528007230	528007240
Pressure (Pa)							
0 V	0	0	0	0	0	0	0
10 V	675	780	1090	1060	1090	1140	1075
Airflow (m3/h)							
0 V	0	0	0	0	0	0	0
10 V	960	1450	2400	3600	2400 (*)	3000 (*)	3600 (*)

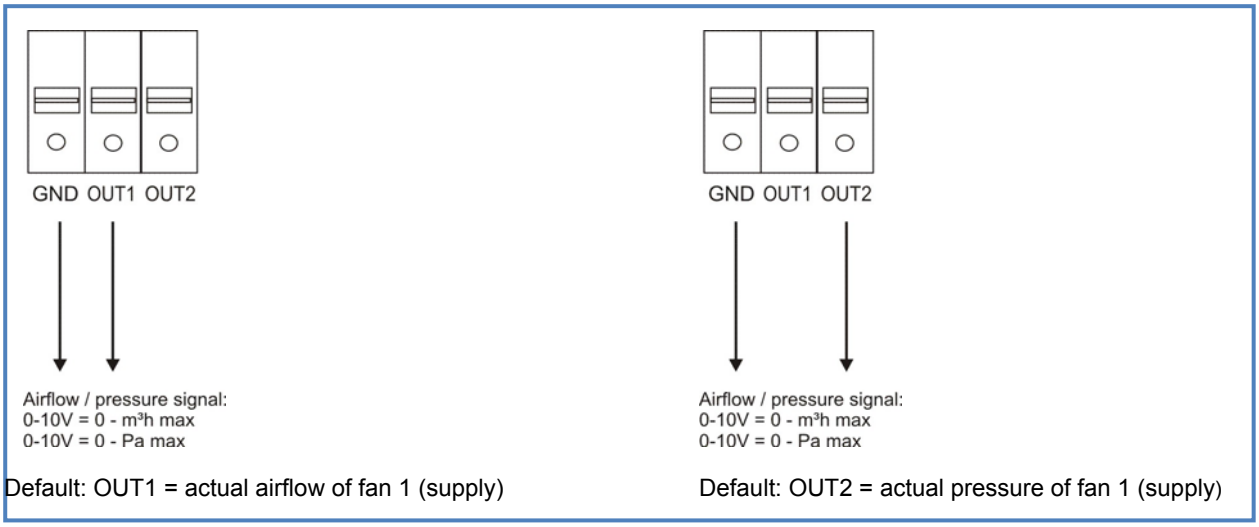
(*) Airflow per fan, Airflow x 2 to obtain actual total airflow).

Maxi flat-series

	maxi flat 450	maxi flat 600	maxi flat 1000	maxi flat 1600	maxi flat 2000
Pressure (Pa)					
0 V	0	0	0	0	0
10 V	650	870	800	930	1060
Airflow (m3/h)					
0 V	0	0	0	0	0
10 V	540	720	1200	1920	2400

Via the ‘advanced setup’ it is possible to connect any of these 2 OUT signals to the airflow or pressure value of any fans.

Wiring diagram of outputs signals:


GND OUT1 OUT2
Airflow / pressure signal:
0-10V = 0 - m³h max
0-10V = 0 - Pa max
Default: OUT1 = actual airflow of fan 1 (supply)
GND OUT1 OUT2
Airflow / pressure signal:
0-10V = 0 - m³h max
0-10V = 0 - Pa max
Default: OUT2 = actual pressure of fan 1 (supply)

4.16 Advanced setup

Using this feature requires a good knowledge of the TAC4 DG control system.

The functions of the ADVANCED SETUP are described in Annexes 1 and 2 of the Installation and maintenance Instructions.

The advanced configuration allows modifying the parameters not present in the basic configuration.

- Stop fans if pressure alarm activated
- Fans start torque
- Prevent stop of the fans (deactivation of the softstop function)
- Fire alarm configuration
- Bypass T°
- Airflow if bypass open
- Force bypass opening whatever the T°
- AF (anti-freeze) configuration
- NV speed (option if NV installed)
- OUT1 and OUT2 definition
- In LS mode: stop of the fans if Vin < and/or > set value(s)
- In CPs mode: - positive or negative logical
  - reaction speed of the CPs algorithm
- Post-ventilation configuration
- Fan run time configuration
- Display alarms only
- Access code configuration
- Factory reset

5 TAC4 DG + RC - Visualization

5.1 Default display

The default setting displays actual airflow, pressure, and alarm (if activated) of the fans (loop 1 → 9 → 1 …):

Step	Text on display	Description
1	SUPPLY(1) xxxx m³h	Display actual supply fan1 airflow (m3/h)
2	SUPPLY2 xxxx m³h	If maxi 4002/5002/6002: Display actual supply fan2 airflow (m3/h)
3	EXHAUST(1) xxxx m³h	Display actual exhaust fan1 airflow (m3/h)
4	EXHAUST2 xxxx m³h	If maxi 4002/5002/6002: Display actual exhaust fan2 airflow (m3/h)
5	Alarm xxx	Display of alarm type

5.2 Display all parameters

By pressing the ↑ and ↓ keys, it is possible to display the status of all the parameters:

Step	Text on display	Description
1	Alarm xxx	Alarm type if relevant
2	REC TYPE xxxxxx	Display of Idcode of heat recovery unit (6 digits)
3	KW IN ? YES	If option KW IN (electrical preheating coil) is present
4	KW OUT ? YES	If option KW OUT(electrical postheating coil) is present
5	NV ? YES	If option NV (postheating water coil) is present
6	CT IN ? YES	If option CT (inlet damper) is present
7	KWext ? YES	Displayed only if external KW option present (controlled by SAT TAC4 BA/KW)
8	BA+/- ? YES	Displayed only if external BA+/- option present (controlled by SAT TAC4 BA/KW)
9	BA- ? YES	Displayed only if external BA- option present (controlled by SAT TAC4 BA/KW)
10	BA+ ? YES	Displayed only if external BA+ option present (controlled by SAT TAC4 BA/KW)
11	MODE CA	Display working mode selected (CA, LS, CPs)
12	SET VAL. xxxx	Display of actual assignment in function of setup and K1/K2/K3 status
13	SUPPLY T°: xx°C	Supply air T° set point (if internal or external post heat/cool coil installed)
14	%EXH/SUP xxx %	Display of the assigned exhaust / supply ratio
15	Pa ALARM SUPPLY:	If activated, pressure alarm data on supply side
16	m³h: xxxx Pa: xxxx	If pressure alam is activated, display of setup values (m3/h, Pa) at which alarm will be turned on for the supply side (CA and LS modes).
17	Pa ALARM EXHAUST:	If activated, pressure alarm data on exhaust side
18	m³h: xxxx Pa: xxxx	If pressure alam is activated, display of setup values (m3/h, Pa) at which alarm will be turned on for the exhaust side (CA and LS modes).

19	ACTUAL VALUES	Display of actual values
20	SUPPLY(1) xxxx m³h	Actual airflow delivered by fan 1, supply side
21	SUPPLY(1) xxxx Pa	Actual counterpressure on fan 1, supply side
22	SUPPLY2 xxxx m³h	If HRg 4000-5000-6000: Actual airflow delivered by fan 2, supply side
23	SUPPLY2 xxxx Pa	If HRg 4000-5000-6000: Actual counterpressure on fan 2, supply side
24	EXHAUST(1) xxxx m³h	Actual airflow delivered by fan 1, exhaust side
25	EXHAUST(1) xxxx Pa	Actual counterpressure on fan 1, exhaust side
26	EXHAUST2 xxxx m³h	If HRg 4000-5000-6000: Actual airflow delivered by fan 2, exhaust side
27	EXHAUST2 xxxx Pa	If HRg 4000-5000-6000: Actual counterpressure on fan 2, exhaust side
28	K1 OPEN	Status of input K1 : OPEN or CLOSED
29	K2 xxxxxx	Status of input K2 : OPEN or CLOSED (CA mode), or xx,x V if (LS/CPs)
30	K3 OPEN	Status of input K3 : OPEN or CLOSED
31	IN1 OPEN	Status of input IN1 : OPEN or CLOSED Select master (RC or CB TAC4)
32	IN2 OPEN	Status of input IN2 : OPEN or CLOSED Pressostat externe pour alarme de pression
33	IN3 OPEN	Status of input IN3 : OPEN or CLOSED Fire alarm
34	IN4 OPEN	Status of input IN4 : OPEN or CLOSED Force bypass open command (independent from T° conditions)
35	IN5 OPEN	Status of input IN5 : OPEN or CLOSED Time table management : automatic (closed) or manual (open)
36	IN6 OPEN	Status of input IN6 : OPEN or CLOSED Internal or external Post-heating option on/off
37	IN7 OPEN	Status of input IN7 : OPEN or CLOSED On/Off of supply fan(s) in case of fire alarm
38	IN8 OPEN	Status of input IN8 : OPEN or CLOSED On/Off of exhaust fan(s) in case of fire alarm
39	IN9 OPEN	Status of input IN9 : OPEN or CLOSED BOOST function
40	IN10 OPEN	Status of input IN10 : OPEN or CLOSED SAT TAC4 BA/KW: On/Off for external cooling coil on supply side (option)
41	IN11 OPEN	Status of input IN11 : OPEN or CLOSED SAT TAC4 BA/KW: selection of Heat/Cool logic for external coil regulation (option)
42	T°1 xx,x °C	Display of the actual value (°C) on sensor T1 (outside T° used for bypass control)
43	T°2 xx,x °C	Display of the actual value (°C) on sensor T2 (inside T° used for bypass control)
44	T°3 xx,x °C	Display of the actual value (°C) on sensor T3 (resulting exhaust T° used for antifrost control).
45	T°4 xx,x °C	If NV option (post-heating water): Display of actual value of T° sensor T4 (used for coil antifreeze control).
46	T°5 xx,x °C	- If postheat option: display of value of T5 (used for the T° control system of NV coil with 3 way valve) (compulsory) - If no postheat option is used this input can display the actual output T° (option)
47	T°7 xx,x °C	Display of value for T° sensor T7 If SAT TAC4 BA/KW option: sensor used to monitor anti frost protection of BA+ coil.
48	T°8 xx,x °C	Display of value for T° sensor T8 If SAT TAC4 BA/KW option: sensor used to monitor anti frost protection of BA- coil.
49	BYPASS CLOSED	Display of by-pass status OPEN or CLOSED
50	NV xx.x V	If NV option: Display of output voltage that drives the 3 way valve on the NV coil.

51	KWin xxx%	Si option KWin: Display of % output value used to drive the capacity of the KWin coil
52	KWout xxx%	Si option KWout: Display of % output value used to drive the capacity of the KWout coil
53	OUT7 xx.xV	If BA+ option: Display of output voltage that drives the 3 way valve on the BA+ coil.
54	OUT8 xx.xV	If BA- option: Display of output voltage that drives the 3 way valve on the BA- coil.
55	OUT9 xxx%	Si option external KW: Display of % output value used to drive the capacity of the external KW coil
56	TEMPS: xxxxxx h	Display of dfan run time in hours. (if activated in advanced setup)
57	A-FREEZE OFF	Display of status of anti-frosting device of heat exchanger or post-heating coil OFF / REC ON / NV ON / BA- ON / BA+/- ON / BA+ ON
58	CT IN CLOSED	If CT option (inlet damper): Display of status of damper : CLOSED / OPENING / OPEN

Although we put a lot of care in the making of our documentation, we cannot be held responsible for any error and/or omissions that could have slipped in.